E. M. Baker

The Monthly Review of the AMERICAN ELECTROPLATERS' SOCIETY

CONTENTS

Editorial 11

Kettering—The Application of Modern Science to the Plating Industry 15

Rohrman—Vagaries of Corrosion Testing 27

Here and There 36

Branch News 42

The Abstract Section 60

Index to Advertisers 66

Membership Report 68

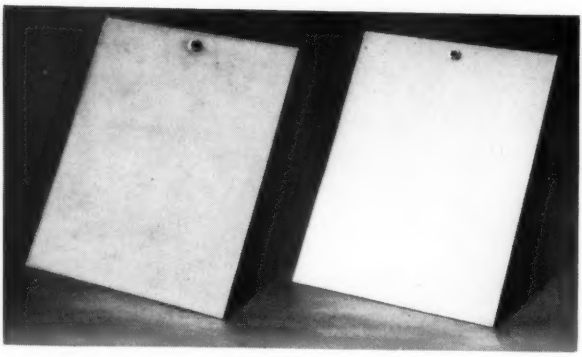
Membership Campaign 69

Buyers' Guide 76

Branch Directory 80

JANUARY 1941

BRIGHT NICKEL PLATED STEEL



Cleaned with Wetting-Agent Silicate Type Cleaner.

Cleaned with Clepo Cathanodic Cleaner—Wetting-Agent Free and Silicate Free.

INVESTIGATE THIS NEW DEVELOPMENT IN CLEANING PRIOR TO BRIGHT NICKEL PLATING

Advantages of the Cathanodic Process

- NO SILICATE CLOUDS UNDERNEATH BRIGHT NICKEL DEPOSITS.
- NO SILICATE DEPOSIT ON TANKS AND STEAM COILS.
- NO WETTING-AGENT EXPLOSIONS.
- NO CONTAMINATION OF SOLUTIONS FROM WETTING-AGENT DRAG-OVER.
- NO SOFTENING OF RACK COVERINGS DUE TO WETTING-AGENT PENETRATION.
- REMARKABLY FREE RINSING.

Write Us For Full Particulars

FREDERICK GUMM CHEMICAL CO.
INCORPORATED
538 Forest St., Kearny, N. J.

Western Distributor
BELKE MFG. CO., 947 N. Cicero Ave.
Chicago, Ill.

CLEPO CLEANING COMPOUNDS

E. Engineering Lib
Mrs. Edwin M. Baker
11-11-43 v. 28, no 1-12

The MONTHLY REVIEW

Published by the
AMERICAN ELECTROPLATERS' SOCIETY, INC.

Publication and Editorial Office
93 Oak Grove Ave.
Springfield, Massachusetts

VOL. XXVIII JANUARY 1941 NO. 1

Editorial

HAPPY NEW YEAR

The spoken expression of a renewed greeting in an old form, something indicative of that which we all wish for others, and ourselves, not only on this one day but for all the succeeding days of the year until the time comes again to remake the wish and forget the disappointments and heartaches of the old year even as the quotation, "Hope springs eternal in the heart of youth"; only in this case all the hopes are concentrated in a new beginning at a special time to achieve a youthful renewing of those good things which all men wish for their fellow mortals.

It would be an excellent thing for all of us, in the heat of midsummer's arguments, to suddenly stop and think back to the "Happy New Year" so wholeheartedly given in midwinter's chill and then start over again with a definite attempt to understand the other fellow's viewpoint in the light of the sincerity of his wish at the entrance into a new calendar.

And indeed this year of 1941 promises to require all the understanding and strength we can bring to it—understanding of local problems in our daily work, of political problems both national and international, and strength to define the proper course for ourselves in these trying times and more strength to stick to that course if it is the right one and even greater strength to admit it to be the wrong direction, if such be the truth, and super-strength to remake a fresh start on the right course.

After listening to Dr. Panzery, ex-vice-consul of France, speak on the collapse of his nation, it was difficult to refrain from drawing parallels with our own country's attitude toward the problems of the day as exemplified by groups and individuals of whom we all have read in the daily news.

He stated that the most surprising thing to him on arrival in this country in 1939 was to observe the suburban gardens and lawns running between neighboring houses without sign of fence or wall; whereas in France, if a man had been fortunate or industrious enough to secure a small or large garden plot, he could not rest until it was enclosed within a wall, by preference, of height sufficient to exclude vision of the passerby.

This withdrawal into one's self was one of the most disastrous trends of the French people since World War I, and was reflected in their seventeen or more political parties, all striving for something for themselves, instead of for the good of the nation.

The individualistic policy tends to understanding but not to action as does collectivism, although there is no reason why any nation or group cannot rally around its standard by democratic unity rather than by herding into action through dictatorship; in fact, the word "collectivism" has lost its truly derived meaning by its application in recent years to the forced herding principle of government.

Where then, in the light of the foregoing, can an organization such as ours do the most good toward fulfilling the aims of its founders and in holding to the principles for which it stands?

The only logical answer is to continue with its broad educational and social aims as evidenced since its inception; only tempering them as the requests of democratic government may desire: either to use its group power, as already offered to the Defense Council, or for its individual membership to make whatever sacrifices for which they may be called upon in the future. Some of our foreign members have already felt the pinch of necessities unknown to us, not even being allowed to pay membership dues out of their countries, so that the Executive Board decided to waive the dues and per capita tax of all those in this category, for the duration; but to continue publication distribution to them as our only possible sharing of their hardships at this time.

One of the things that is tending to knit our organization more closely together is the appearance of all of our supreme officers in as many different branches as possible, so that they have an understanding of the problems of the various groups and in turn can explain those misunderstood by one, to the others. This policy, although adopted by the Dayton convention without a dissenting vote, has since brought forth some criticism during the year which, if general, should be threshed out on the floor of the Boston convention, as it would appear to be the most direct method of having all working for one and one for all—provided all agree the ones are the right ones to hold office and speak for the whole group; which if they are not, no better way of finding them out was ever invented than bringing them face-to-face with their constituents as often as necessary to produce a decision at the next election.

Other problems have arisen during the past six months, some of which are not as yet settled, but the Board is endeavoring to secure adequate councils and come to just decisions on all matters after careful deliberation, rather than to make hit or miss decisions which later prove indefensible.

One decision which we believe was properly made was to grant the Indianapolis Branch a permanent charter; they have officially become the thirty-first chapter of our group and are entitled to our welcome for the excellent beginning they have shown.

If space would permit and reader patience allow, it would be a pleasure to continue until all who have read would be equally as familiar with the many reflections of our multi-faceted organization as are those in a position to catch some of each reflected beam; but every member may be assured that whatever such knowledge he wishes is his for the asking, either in person or by mail—and this cannot be emphasized too much.

I want to publicly thank our founder, the members of the Board, committee chairmen, and the many individuals who so kindly sent telegrams, letters or cards of best wishes at the Christmas season in such numbers that it was impossible to reply individually; but please believe the return of the wishes to each sender is hoped for manyfold in the coming year.

FREDERICK FULFORTH

BOSTON BRANCH DEFIES COMPETITION-!
AMERICAN ELECTRO PLATERS SOCIETY
CONVENTION HEADQUARTERS
UNDER ONE ROOF
HOTEL STATLER
OLD STATE HOUSE
PAUL REVERE
FANEUIL HALL
OLD IRONSIDES
BOSTON TEA PARTY
TOUR TO PLYMOUTH ROCK
1620
BUNKER HILL
BOSTON BAKED
SITE OF BOSTON MASSACRE
SCENERY
LEXINGTON
PORTS
HISTORICAL BOSTON - CRADLE OF AMERICAN LIBERTY
A REAL DISH IN STORE FOR YOU AND THE LADIES---DON'T FORGET TO BRING THEM-
REMEMBER ME! TIE A STRING AROUND YOUR FINGER AND DON'T FORGET TO MAKE RESERVATIONS EARLY!
ANDY GARRETT WATCH DOG OF BOSTON BRANCH
BEACON HILL
SEE America's HISTORIC SHRINES
GENERALISSIMO
JOE BARRON
1941
CONVENTION
GREETER
29th Annual NATIONAL CONVENTION-
JUNE 9, 10, 11, 12
COME BY BOAT, TRAIN, CAR OR PLANE !!

E. Engineering
Mrs. Edwin M. Baker
11-11-43

The Application *of* Modern Science *to the* Plating Industry

By
DR. CHARLES F. KETTERING

Presented before Detroit Branch Fourth Annual Educational Session, December 7, 1940.

I HAVE been associated with electroplating directly and indirectly for a great many years. Some years ago at the National Cash Register Company we worked with the plating department under a man by the name of Fraine. We were very closely associated with the plating problem, which at that time was an important one. Later on we found the best way to get rid of plating difficulties was to throw the plating out so we went to enamelling instead of plating. I think that is something we overlook entirely too much: the fact that we never have any trouble with anything we leave off.

Of course, it doesn't make any difference with what branch of science we are associated; we are all interested in material and energy relationships. It happens that the electro-chemical phase of plating is one of three or four important factors in the electrical industry. It is also one of the earliest ones. I think electroplating began when Alessandro Volta first wired a frog's leg.

When I analyze the electrical industry, I divide it into its different phases. I list all the items that come under the heating phase, the magnetic phase, the radiation phase, etc. We are never able to separate these effects. In electroplating we can't eliminate the heating and magnetic effects. They are all pretty well mixed, but we try to separate them and use just the ones we want.

Now the electroplating industry has had a great effect upon the development of electrical machines. Modern electrical instrumentation was started due to an electroplating problem which arose long before we had ammeters, voltmeters, etc. The problem first came up when old Dr. Weston was making plating generators. He had no way of measuring either the voltage or current at that time. Generators were rated on a one inch, two inch, and three inch basis. What was meant by that? A one-inch generator would produce dull red heat in a bar of

iron one inch in diameter and so many feet long, when the bar was connected to the generator terminals. A two-inch generator needed a two inch bar. Dr. Weston said that that was a poor way to measure, and so he began to develop instruments. The Weston Instrument Company came from a desire to have a better way of rating generators than by heating an iron bar.

To find out whether or not we are in the doldrums all we need to do is to go back and see where we came from. I think the history of the deposition of metals by electrical current will show you that you have made a lot of progress although we still have so much to learn.

For example, I don't know whether you electroplaters have been affected by this radio development where it has been found that the current doesn't flow from the positive to the negative but flows the other way. I don't know whether that has upset your theory of plating or not. A college student who is graduating as an electrical engineer came to me the other day and said: "How is it possible for the current to flow from the negative to positive in the radio and from positive to negative in a plating tank?"

I said: "I don't know anything about that. I haven't anything to do with which way the current flows."

It may upset some of our theoretical considerations if the current goes opposite from the way it is supposed to go but again it doesn't make any difference what we think about it. It goes the way it does, and the fact that we don't understand it doesn't make any difference. I think the upside-down theory is as nearly right as the rightside-up theory. Just as long as we mix it up and it works—that is the important thing. As a friend of mine said, "The only difference between theory and practice is that practice doesn't let you forget anything."

In these days of apparent upset in the world we can take one of two views of the situation: either there is no use trying to do anything or there is. Now I can't be too excited about the situation that we are in today because we don't have to read very much history to find out that this isn't the first time we have been upset. A friend of mine in England sent me a little monograph on Michael Faraday. I picked up the story and the opening paragraph, quoted from a history written about 1800, read: "Napoleon controls the whole of Europe, and England is

without a friend." Well, they have just moved a little farther east now, but it sounds exactly the same.

So if you will really consider the situation, I don't think you will find very much wrong with the world; that is, the movement in Europe is not affecting the electroplating solutions in this country; the bugs and bees and butterflies are getting along just about as well as they always did; the potatoes and tomatoes grow about the same. However, you will find that the only things upset are the relationships of civilized people. They are the only people who are fighting—the civilized ones. The savages are getting along perfectly all right. The educated people are the ones who are fighting.

Now I think this deserves just a little bit of analysis because, from a scientific point of view, it has the greatest effect upon the future outlook. I think that the human race is the only one, as far as we know because we have not been able to talk to any other biological organism, which has been separated from its normal instinctive reactions. In other words, we have developed the thing called intelligence and have finally reached the dividing line between intelligence and instinct. Instinct has been operating so much longer than intelligence that it is better trained and often takes precedence.

I think it was Thomas Jefferson who said: "The second solemn thought is always necessary and seldom wrong."

Well, there is no first solemn thought; it is instinctive reaction. Of course you platers and electro-chemists may be an entirely different type. You may never get sore at anything; you may never get any letters that make you want to tell the other fellow off but, if you do, write that letter and then let it lie for a while. That is your instinctive letter. Two days later take it up and read it and then write an intelligent letter.

I think there are some of you like that, and I know I've had it happen to me. I get sore—I won't say how sore—but that is my instinct.

That is why you have to be very careful, and that is tremendously important for another reason. You should never spring a new thing as a surprise on a technical man because his instinct always acts like that. He goes on record and you have to pay for it because he makes an instinctive statement and he must stand by it to save his face. He must be persuaded gradually.

You say: "Here is an idea that I know doesn't amount to anything, but I thought you might like to see it."

He says: "I agree with you that it doesn't amount to anything."

You show it to him for two or three years and finally he will say: "I think you are wrong about that." Finally he will think there is something about it that is good. Maybe you don't have to do that but I say that instinctive reaction is always ready to act like that. People must be persuaded to accept new things. Intelligence has been making better devices, new processes and new products, but remember the old instinct.

Then someone comes along and says: "I'll just take what these intelligent men have developed, and I will make it work for me." He develops a new weapon.

The airplane is a weapon this time. It is 37 years since the Wright brothers made their first non-stop flight of 120 feet in 12 seconds. It was very, very unimportant at the time; when the boys made the flight they wired to their sister in Dayton and told her that they had made the first non-stop flight in a heavier-than-air machine propelled by a motor and, of course, that they were very happy and would be home for Christmas. She received that telegram about 11:00 o'clock at night and telephoned the newspaper. She rang and rang—I guess the boys were playing pinochle—but finally some one answered the phone. She said: "This is Catherine Wright speaking. I have a telegram from my brothers. They have made a flight of 12 seconds for 120 feet in a heavier-than-air machine propelled by a motor. They are going to be home for Christmas."

The reporter said: "Well, I am glad to know the boys are going to be home for Christmas."

That flight didn't impress the newspaperman even to the extent of mentioning it, yet in 37 years it has become the means by which the instinctive reactions of somebody else, using the intelligence put into it, attempt to control the entire thinking of men.

Our reactions to new things and the variable between instinct and intelligence are still the most important problems with which we have to deal. They are important because we have in this country a problem which is unlike that of any other country ever before. We have the problem of excesses. We

have an excess of men. We have an excess of money. We have an excess of materials. Somebody, incidentally, said that we have an excess of debt but I think that the excess of debt is a result of the other three excess. The only reason for these excesses is a lack of projects. Not having any projects, we shouldn't let the WPA and PWA irritate us because their work is about as good a project as a politician can invent. But, as a consequence, we are at an exceedingly low ebb of technological development. We are not suffering from over-technology but from under-technology. We need an enormous number of new projects because, if we had them, we wouldn't have men out of work. We would have new things we need and business would pick up but because of this instinct-intelligence relationship a lot of people feel there isn't a single new thing that can be done and so they say that they don't see how to do this, that and the other thing. We have reached the state where we are losing very rapidly the necessary point of view for continued technological advancement.

Now then, the reason we know that technological advancement is possible is that, outside of the plating industry perhaps, nobody knows his business. I am taking for granted you fellows know all about yours.

I was talking to Dr. Coolidge of the General Electric Company the other day and he told about a little experiment they had run on the continued keeping of heat on a strip of metal and what happened to it in 150 or 200 hours. He said it was terribly disconcerting because we thought we understood the factors of metal crystallization and now we find out that we don't.

I said: "You are the last person on earth I ever expected to be disconcerted about a thing like that. For instance, we have a lot of disconcerting things in our business. We developed a clutch spring for Chevrolet a number of years ago which was just a big notched Belleville washer. We took that to the boys who do the figuring, and they determined right away that it wouldn't work. They proved it when we made some just like the drawings and they broke in a couple of thousand movements. That checked exactly with their figures. However, if we shot-blast that clutch spring, it will run 20 million cycles and won't break so what good were those figures? If we want to we can

prove almost anything with figures. I can take a slide rule and stop the universe.

I think you can figure out your plating if you have a big enough factor of safety. I think 10 or 20 is all right. You are good within 5% or 10% of what your plating actually is unless you are following a completely new setup. You know the rate at which you do it. Put X number of amperes down, and it ought to plate over so much. What kind of layer are you going to get? That is a "horse of a different color." Maybe it is no good. You have to cut and try until you find out. It breaks all of the rules of calculation and investigations on materials. It doesn't follow at all. The refinement of a job is very interesting and is very important because you may have to throw away a lot of tables.

Just take a pencil for example. When we begin with a new pencil we have a big factor of safety; we can say that the little ferrule and eraser, just one-eighth or one-tenth of the length of the lead pencil, is unimportant because it is a small percent of the pencil but, when we continue to sharpen the pencil, the eraser becomes relatively more important. When we make refinements in our business it is like sharpening the lead pencil. Sometimes the factors that were at first unimportant become as big as the fundamentals. When we shotblasted those clutch springs we entered a new phase of the fatigue value of materials that had been given little consideration up to that time.

We see this in the aviation industry. With these great, enormous airplanes they design with rather low relationships of weight and strength of materials, they have to take into consideration many factors hitherto neglected. I imagine that same thing happened to the plating industry. Now you have to tighten your limits. As you do that you uncover new things and consequently reorganize your work.

To see if there is any absolute limitation to technology let's see what's been done with the atomic tables. Let's start with hydrogen, the lightest one. A few years ago there was only one hydrogen, that is, until Dr. Urey experimented and found two or three of them. That is what happened to the simplest element we have. Experiments with complex elements such as uranium have sometimes resulted in the commutation of a hydrogen atom. How much do we know about this? We don't know

anything about this. Here in the last year or so with the work Dr. Lawrence has done out in California with the cyclotron and with the larger cyclotron he is building, we begin to get an entirely new notion about materials and their relationships.

The thing that we need to do and one of the things I think is perhaps the hardest for most technical people to do, is to remember not to think too much about the rules and regulations governing technical work. We must not forget two important factors. One is what the other fellow thinks and the other is how much it costs.

I am a great believer in the so-called four-dimension theory. The three dimensions are length, breath and thickness, and the fourth dimension is cost. I think it is very much better to say that this has to be done for this cost before starting with the other three dimensions because after the other three dimensions are fixed, the cost is fixed right along with them.

In doing research and development work we can't have something that costs too much. We have run into this cost dimension in the last few years; especially with some of the work we have been doing with the National Defense Program in which cost was not given as a factor. It has introduced a super deluxe complication of length, breath, and thickness that makes it almost impossible to operate.

Suppose we are designing certain kinds of scientific instruments for a very important purpose. We have a little shop with a few men working for us, and we will say that an instrument is going to cost about $6,000. The buyer says that he won't pay that much for it and we have an over-complication.

Sometimes a great invention is developed by discarding the extras. We found that we were able to discard 80% of one device and have it about five times as good.

Well, we know you gentlemen have had the question of cost before you. How much does it cost? That question sometimes has a greater effect upon your thinking than pure technique. That question is a double-edged sword and has to be watched very carefully. If you are forced down an alley on the cost proposition sometimes you miss the right road. There must be a certain cost liberality in the experimental stages of a project before a good job can be done. There must be some balance between a process that has to do only with cost and one

that has to do only with product. Those two things sound miles apart and they are miles apart but, if you are good engineers, if you are good technicians, you will bring those two together so that you obtain maximum quality with minimum cost. That is a real technological accomplishment.

When I see a group of men who have their own special technical problems, problems with which their customers aren't acquainted, it reminds me of some paint tests we ran in Florida. The atmosphere of southern Florida is supposed to spoil all sorts of finishes. We have had a laboratory in Florida for ten years. Finishes weather pretty quickly when exposed to Florida atmosphere. I said: "Let's try to find out what is meant by weathering."

We tried to analyze what is meant by weathering. With respect to paint and varnish finishes everyone was perfectly sure it was the sun. There is a large book on the effect of ultra-violet light on paint. We exposed one set of test panels from 6:00 o'clock in the morning until 6:00 o'clock in the evening and we exposed another set for the same period during the night. The interesting part was that the panels exposed at night deteriorated first. That made people think about that book on ultra-violet light.

The same thing that spoils paint spoils plating. If you have little holes in your plating, you can spray a hose or salt spray on it all you want to and it isn't going to have any effect on it but if you wet that plating or surface with dew, you will wet it from the bottom up since the moisture enters as vapor, condenses, and fills the crack. This destroys the finish. Despite all the big thick books that have been written, all that is needed to ruin the finish is to alternately heat and cool the surface in a normal atmosphere and thus cause moisture to condense and evaporate on the surface.

These are just the "fleas" that bother us all the time. We must never lose sight of the fact that there are lots of new things that are going to happen and all of them are in the years ahead.

I have often said we study history so much that we are always looking and keeping our faces turned backward. We get so many surprises because we back into the future. I would like to introduce a new course in our schools. Let's keep history but let's split the time we are studying history, studying

what we have been and where we are from; let's take a small part of that time and study where we are going. Some good inventor should invent the opposite word for history, a word which will mean looking forward in the same way that history means looking backward. Let's introduce a course in that. I don't know how to write a book but all I would have to do is ask what am I going to do? That will help me to write a future history.

I am not worrying about our problems. These new things, these changes, are in the calendar. Every time we print a new calendar we print a lot of changes we don't see because they appear just as the days of the month. Every time we tear a leaf from the calendar we have done something to our business. If we say that we don't think that idea amounts to anything, we get out of date. We can get into trouble two ways. We can get into trouble by tearing too many leaves from the calendar and trying to make our February dates in January. If we are alert and have an implicit faith that what we are doing today is going to be better tomorrow, then we won't have very much trouble.

I am not at all worried over our present situation. I know if we can quit studying so much history and study the future a lttle more, the future will be just exactly what we think it ought to be. What we have today is exactly what some person thought it ought to be. We let the wrong fellow do all the thinking. We should do the thinking instead of the other fellow. In other words, I think the future can be a pretty nice place. I am very much interested in the future because I expect to spend the rest of my life in the future and I would like to have it a pretty good place in which to live. If we get an idea of what we can do and begin to look forward with more intelligence than instinct, I think the technical man can be one of the most important persons in the world. I like to meet the person who says that we have gone technologically too far—I like to meet him any place because he is just as wrong as he can be. The answer is that we have excesses of men, money, and material. We haven't had enough plans. We haven't had enough free thinking. We haven't tried to produce the best deluxe product on the one hand and do it at the lowest cost on the other. We have to do those

two things side by side. If we can get industry and management to understand that, then there is nothing to it.

You men are representatives of one of the technological groups of the American Electroplaters' Society. All of us are dealing with material and energy relationships applied to people. Regardless of what people tell us about the world going to hell, don't believe it. I believe it will only go to hell provided we think it is going to go there. If we think it is going to improve it will improve and will be a better place to live; if you think you will get plating that won't rub off or rust, you are going to get it. We won't have any more than we think we can have.

How long will an engine run? It will run just as long as the designer thinks it ought to run and it will run longer if somebody else thinks it ought to run longer. I am going to give you a specific illustration of that. We first developed the Diesel engine for railway purposes and one of the first things the railroad men asked was how long did we think they ought to run before being overhauled? I said: "I haven't the slightest idea of how long they ought to run."

They said: "Will you guarantee them for 100,000 miles?"

I replied: "I haven't anything to do with guarantees, but I am sure General Motors would guarantee them for 100,000 miles. However, if I were your engineer, I would think that was terrible because you are operating them 1100 miles per day and that means overhauling them every three months."

Why did they say 100,000 miles? They said 100,000 miles because they had been running busses on a hundred-thousand-mile basis. Well, when we started to run these Diesel engines the piston rings would run about 80,000 miles. We changed pistons and rings and got 125,000 miles. We improved them again and today they are running 400,000 miles. Someone said that we ought to leave well enough alone. How often do we have to grind the cylinder liners? We had to grind them every 150,000 miles in the beginning; now we don't grind them for one million miles.

Anything will be what you think it ought to be and, if you keep in mind that things are what you think they are and not what the Lord made them, in a good many cases you can accomplish an awful lot.

A man came the other day with a piston and he said: "I

can't see why you fellows are using old-fashioned pistons in your bus and truck Diesels."

I said: "I didn't know that they were old fashioned."

He said: "That piston was used 25 years ago."

He was wrong about that but his real worry was this: those busses travel 24,000 miles a month, and the average motor car goes 10,000 miles a year; our pistons were going 2½ times the distance in a month as his were going in a year or, over the same time period, 30 times as far. I asked him if he would guarantee his pistons and he said, "For 25,000 miles."

I said: "That is for one month."

His pistons were all right for passenger car service because that is two and one-half year's service in a motor car but what was all right in one wasn't all right in the other; we run these truck Diesel pistons 300,000 miles before changing them.

The last thing I would like to say to you men is don't let anybody tie you down as to how good, how efficient and how practical an electroplating job ought to be. Set up a fantastic ideal that is way beyond where you want to go but don't stop the whole factory while you are getting there as you may only have a fantastic idea and no job. If you can mix those two and get that idea out, someday you will be surprised at what you have accomplished.

Faith, intelligence and industry are the things that make us what we are.

HOLE IN ONE

Oh, they laid me on a table, and they marked with fiendish glee
Every vulnerable portion of my poor "anatomee."
With the masks upon their faces and their lances gleaming bright,
I'll admit to all and sundry, they were not a pleasing sight!
Then I heard one say distinctly, though they thought I was asleep,
"Do you think there is anything at all that he would like to keep?
His poor old bladder's oozy, and his kidneys are not right,
But the chances of improving them are very, very slight,
So, for the present anyway, we'll leave them as they are,
For we might get into trouble if we go a bit too far.
Did you hear his wifey warn us, as we brought him up the stairs,
'Don't you fellows go and send me in a big bill for repairs;
I might better trade him in and get a new one—that's a cinch,
So go easy on the carving if you're charging by the inch!' "
Well at this I promptly fainted, and of course I'll never know
How much of me they carried off; at least it doesn't show.
I'm trying to forget it, but I really wish sometimes
They had cut out my propensity for making foolish rhymes!

WALTER S. BARROWS, Toronto Branch.

(We are glad to note from the above that Mr. Barrows is well on his way to recovery.—*Ed.*)

INTERNATIONAL JOINT EDUCATIONAL SESSION AND BANQUET

by

Toronto and Buffalo Branches of A. E. S.

February 8th, 1941 (2 P. M.)

Fox Head Inn, Niagara Falls, Ontario

2 P. M. Standard Time. Price $2.00 (Stag)

Speakers

F. C. Mesle, — Silver Plating to Standard Specifications.

G. B. Hogaboom, Sr., — Bright Nickel Plating.

F. F. Oplinger, — Copper Plating.

F. E. P. Griggs, — The War Influence on the Cleaning and Plating of Metals.

BALTIMORE-WASHINGTON ANNUAL MEETING

SATURDAY, FEBRUARY 8

At the Hotel Continental (Near Union Station)

Educational Session 2:30 Entertainment and Banquet 7:00 P. M.
Tickets $2.50

Speakers - Mr. E. J. Roehl, International Nickel Co., Inc., Bayonne, N. J.
Subject: "The Adhesion of Nickel Deposits"

Mr. Urban A. Mullin, Wright Aeronautical Corp., Paterson, N. J.
Subject: "The Use of Electrodeposition in the Airplane Industry"

Mr. E. T. Candee, American Brass Co., Waterbury, Conn.
Subject: "A Movie on Copper Production, "From Mine to Consumer" released by the American Brass Co. and a description of plating done by Waterbury Branch.

Mr. D. S. Hartshorn, Jr., The Enthone Co., New Haven, Conn.
Subject: "The use of Wetting Agents in Cleaning and Plating Solutions"

Chairman of Educational Session, Dr. A. Brenner
Chairman of Entertainment Committee, T. F. Slattery
General Chairman, L. L. Turner
Secretary, C. T. Thomas

Vagaries of Corrosion Testing

By F. A. ROHRMAN
Michigan College of Mining and Technology
Houghton, Michigan

Delivered to the Fourth Annual Educational Session, Detroit Branch, December 7, 1940.

THE physical properties of a material are, as a rule, easily determined. But to establish some value for the possible behavior of a material in a chemical medium is a far more difficult proposition. The problems of corrosion testing have represented many controversies. Obviously, the purpose of all corrosion tests is to economically evaluate the chemical resistance of a material. The desirability of predetermining the corrosion resistance of metals and alloys has led to the importance and necessity of various corrosion tests. If one knows the general properties of a material, why can't one predict its suitability for a definite purpose by means of prior tests? In other words, if a material is found to be resistant to certain acid or salt solutions, why can't it be assumed to be useful for purposes where corrosion is believed to be less severe?

All corrosion tests are essentially accelerated tests and they should serve their purpose if they duplicate or intensify the actual field conditions. The chief criticism of most corrosion tests is that they do not simulate the actual service conditions. An alloy may test well against certain media under controlled conditions and yet when applied to practical use under almost identical influences may prove worthless. The frequency of such experiences has led to many doubts concerning the value of corrosion tests. It is the purpose of this paper to clarify and evaluate corrosion testing.

One might establish the following order of thought or procedure when starting a corrosion testing program.

1. Decide what to test against.
2. Decide what to test.
3. Establish or determine the physical nature of the material to be tested.
4. Operate the test so as to simulate future use.
5. Interpret the results.

The logical prosecution of these five points should give one all the information regarding the worth of the material.

WHAT TO TEST AGAINST

The first difficulty one encounters is that he is rarely able to operate the test under actual field conditions. It is often unwise or impracticable to place the test pieces in the plant or operation. If this is not done then one can only compromise. One must attempt to simulate the environment of the corroding medium, be it a chromium plating bath, a pickling solution, a fruit juice, or a corrosive vapor. This will entail the first difficulty. The variables which might present themselves in a simple sodium chloride solution, for example, are as follows:

	Variable	*State Inducing Greatest Corrosion*
1.	Concentration	Medium concentrations
2.	Purity	Variable
3.	Oxygen Concentration	High
4.	Temperature	70° — 85°C.
5.	Circulation	High
6.	Volume of Solution	Large volumes
7.	Area of Solution Surface	Large area
8.	Depth in Solution	Variable
9.	Presence of Light	Variable

It should be possible to regulate or intensify each one of the above factors so as to establish the predominating factor, if any. Neglect to consider one or more of these variables might result in values which could be not reproduced or interpreted. Many tests on different metals have proved that the highly concentrated or saturated media are not always the most corrosive. The salt or acid solubility and the oxygen solubility oppose each other, and since the presence of oxygen is often necessary or contributory to corrosion, a maximum will occur on the corrosion concentration curve. Incidentally, Sir Humphrey Davy found this to be true many years ago. In some solutions an increase in oxygen concentration always promotes corrosion, in others the opposite effect or no influence is noted. The following table may be given for general reference.

INFLUENCE OF OXYGEN ON CORROSION

1.	Hydrogen evolution type of corrosion ($Zn+H_2SO_4$)	—no effect
2.	Passive film forming elements (Fe, Ni, Stainless)	—variable effect
3.	Noble Metals (Cu, Cu ailoys)	—greatest effect

The presence of some impurities will encourage corrosion such as traces of ferric chloride while traces of other materials will inhibit corrosion such as glue. In the oil refineries considerable

trouble is experienced by corrosion from waters contaminated by traces of oil.

The volume, depth, and surface area of the solution often exert their variable influences. Oxygen solution is controlled somewhat by the surface area, and the concentration by the depth or pressure of the solution. A large volume of solution will resist changes in composition by contamination of dissolved metal or depletion of acid by displacement.

The presence or absence of light of variable wave length undoubtedly influences the course of corrosion. It has been observed in some cases that light promotes corrosion and in other cases retards corrosion. It would seem wise to conduct some tests in the light and some in the dark.

WHAT TO TEST

What metal, alloy, or material to use for a definite purpose is, of course, the chief aim of all corrosion testing. The fact that there are so many materials available on the market makes it desirable to secure a rapid means of eliminating the useless and finding the useful. Industry offers many hundreds of metals of which exhorbitant corrosion resisting claims are the rule rather than the exception.

In order to save time, it is desirable to have on hand a library of metals. It is not necessary to have on hand every metal or alloy fabricated but a few key metals or alloys which will bracket a potentially large group. A key library of metals for the average corrosion engineer might consist of the following:

1. Aluminum
2. Copper
3. Silicon—copper bronze
4. Nickel
5. Silicon—iron
6. Steel
7. "18—8"
8. 12% chromium stainless
9. 24% chromium stainless
10. Nickel—chromium—molybdenum—iron alloy
11. Silver
12. Lead

A few rapid tests with the above metals and alloys enables one to find one or more resisting types. After the eligibles are selected and the corroded ones eliminated, one can test an extended

group. If steel is satisfactory, then there are many kinds of irons and steels of the low-alloy type which might represent decided improvements on the original tested specimens. If nickel seems suitable, then there are the Monel metals, Inconel, Ni-resist, etc. In making the final selections, the ultimate cost and physical properties of the material must be considered.

PHYSICAL NATURE OF MATERIALS

It is unfortunate that the physical treatment or the physical nature of the material is often disregarded when evaluating corrosion tests. The fact is that physical treatment might cause the corrosion rate to fluctuate more widely than a change in the metallurgical analysis. One need not mention that differences in the analysis of tenths, hundredths, or even thousandths of one percent might give enormous differences in corrosion rates.

The following physical factors should be considered during a corrosion testing program:

1. Heat treatment
2. Physical treatment
3. Rate of having been electroplated
4. Condition of surface

In some cases quenched samples will corrode more rapidly or destructively than will slowly cooled samples. Any form of cold work, shock, or that caused by machining, cutting, or drilling induces a greater tendency to corrode. Samples which have been rapidly electroplated ususally corrode more rapidly than those electroplated slowly. Specimens which are highly polished will have a much smaller surface area than will the rough or scratched specimens. It is obvious then, that the former will present less surface to corrode than the latter.

THE OPERATION OF THE CORROSION TEST

The corrosion test should simulate the actual proposed use if it is found impracticable to place the samples in the plant. If this is not possible one may exaggerate one factor or another so as to intensify the most severe possibilities of practice.

As to the size of a test specimen to employ, there is considerable variance. As a rule, the larger the specimen the greater

the accuracy, but a specimen might also be too large to handle easily. The writer prefers samples 2 inches by 2 inches by 1/16 inch for several reasons. In the first place, two inch stock is generally available. In the second place, such samples give approximately one-half square decimeter in surface area and the square decimeter unit is often used for reporting corrosion losses. Finally, such samples can be conveniently weighed on the average analytical balance as they average 30-70 grams depending on the metal. A sample of this size is convenient to examine physically.

In preparing a sample for a test one realizes, of course, that it should be clean and held only by the corners or edges. Contact with metal tongs should be avoided; this can be accomplished by slipping small test-tubes over the tong arms.

If the specimens can be supported in a rack or cradle directly in the plant operation most of the variables concerning the corroding medium are controlled. This may not always be possible so that glass containers are employed, not that glass is without influence upon corrosion but that no other material seems as satisfactory. Contact with rubber should be especially avoided because of the sulfur-contamination danger. In solutions they should be upright and separated from the other samples. Outdoor samples should be placed vertically, horizontally, and on the slant facing all corners of the compass.

Boiling solutions have the habit of distilling off more volatile constituents so that the original composition of the medium is not maintained. This difficulty can be eliminated by the use of wide mouth flasks fitted with ground-glass condensors or more simply by the use of beakers fitted with distilling flasks whereby cooling water passes through the flask.

As to the time of exposure, that should be varied. Checks over periods of one hour, five hours, twenty-four hours, and one month are desirable. A plot of the corrosion versus time usually gives desirable information. Metals and alloys will fall into one of the following three general classes, when such data are plotted. Figure 1A gives the corrosion history of a metal which is steadily dissolved by a medium, as would be expected in the action of acids upon zinc. Figure 1B illustrates the corrosion of a metal which is superficially protected by a passive film. In the initial stages of the action very little metal is dissolved owing to the

protective nature of passive film; as this film is slowly dissolved the metal is exposed and corrosion proceeds more rapidly. The corrosion of "18-8" in hydrochloric acid solution is typical of this general type. Figure 1C demonstrates the corrosion of a metal which tends to build up a protective film during the exposure. The initial attack is rapid but is gradually thwarted by the passive film which is slowly built up on the surface. This type of attack may be represented by that of silver in hydrochloric acid solutions.

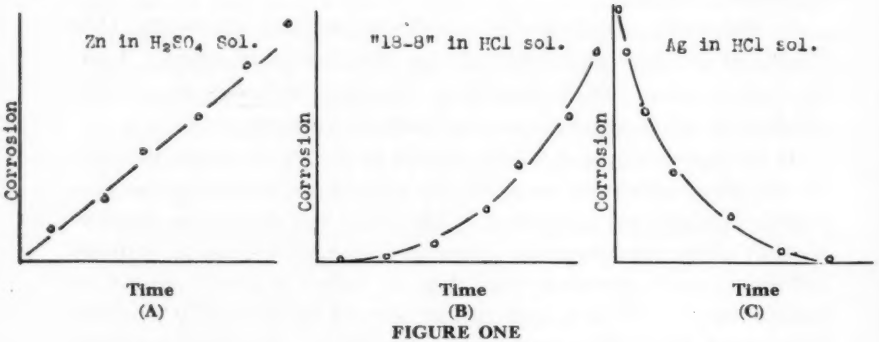


FIGURE ONE

It should be evident that the time of exposure is an important function to be considered when obtaining corrosion data. The value of a corrosion rate might be meaningless without reporting length of exposure.

INTERPRETING THE RESULTS

Corrosion data would be of little value if they could not be translated into tangible terms. A corrosion value may tell a story of the past as well as indicate behavior for the future. It is the interpretation of the results obtained which may or may not lead to useful information. Here is where the average corrosion engineer meets his greatest difficulties.

After a metal has been exposed to corroding media it may be examined, given a physical test, or weighed for possible loss or gain in mass. The presence of stains, colors, pits or holes are all indices of chemical attack. Loss in physical properties often shows the results of corrosion which are not apparent by other means.

Most of the data on corrosion is expressed in terms of loss per

unit area per unit time, or depth of penetration per unit time. Two of the most common expressions are grams loss per square decimeter per hundred hours and inches penetration per year. The latter can be obtained from the former by the use of formula.

$$\text{Inches penetration per year} = \frac{\text{grams loss/dcm.}^2\text{/100 hrs x 0.000006}}{\text{density of metal}}$$

The probable life of a metal based upon data of corrosion penetration is subject to the reasonable criticism that metals rarely corrode uniformly; pitting is the usual manifestation of corrosion. Such data are liable to over-estimate the useful life of a material.

It is sometimes difficult or impossible to determine weight losses. This may be owing to the infinitesimal loss or to the fact that the specimen may be a fixed piece of equipment. It is then necessary to determine the progress of corrosion by an analysis of the corroding media. The writer has had occasion to employ this means in two different cases. In the first case, the corrosion of nickel and copper pasteurizing tubes was estimated by determining the metal content of the milk before and after passing through the tubes. In the second case, the useful life of a large steel pipe delivering mine water from a deep copper mine was estimated. The copper and iron contents of the mine water were determined at the source and discharge which gave sufficient data for a reasonable estimate on the probable life of pipe.

Most of the electroplaters are familiar with the ferroxyl test for pin holes in plated iron. By this means paper saturated with a ferrocyanide and salt is placed over the plated specimen. The salt solution penetrates any pore and induces the iron to corrode. The corrosion products of iron react with the ferrocyanide to give an intense blue color which appears as a spot at any scratch or pinhole. The same type of test can be employed with other metals as well as iron, the only reagents necessary being a sodium chloride solution with a chemical which will give a color test for traces of the base metal.

It is very desirable that corrosion losses be plotted against variables such as time, concentration, temperature, or some other factor which can be easily controlled. The basic reason for these curves is information. It will often be found that some

range of concentration of temperature will give inconsistent results. Disturbing as these results are, they will tell their own story. It is almost impossible to change one variable without changing other variables. Examples are: as the concentration of a solution increases the oxygen concentration decreases and the conductivity varies; as the temperature of a solution is increased the oxygen concentration decreases and the conductivity increases. The different factors may reinforce, oppose, or have no effect on each other. It is difficult to get uniform checks on the corrosion of nickel in dilute hydrochloric acid, aluminum in dilute acetic acid, stainless steels in strong acetic acid, etc. These anomalies occur because of the influences of other factors which are difficult to control. In the case of nickel oxygen concentration is the factor; with aluminum it is hydrolysis; and with the stainless steels it is a question of the thickness of the passive films. Figure 2 illustrates some of these vagaries with corrosion plotted against concentration. Figure 2A is that of nickel in hydrochloric acid, Figure 2B that of aluminum in acetic acid, and Figure 2C that of 18-8 in acetic acid.

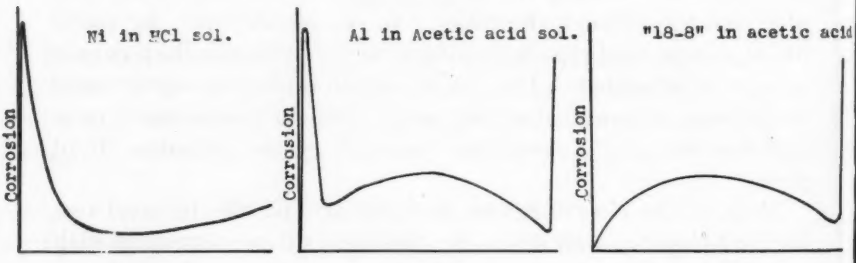


FIGURE TWO

MR. SODERBERG CHOOSES HIS COMMITTEE

Mr. Fulforth:

I am pleased to advise you of the names of the members of the Paper Awards Committee. They are as follows:

1. Ernie L. Beightol of Grand River Plating Company
2. Maurice R. Caldwell of W. B. Jarvis Company
3. James E. Fritts of Ternsted Manufacturing Company
4. Edgar A. Hahn of Ainsworth Manufacturing Company

You will, I believe, agree with me that they are all splendid representatives of the advanced platers of today. I expect them to show excellent judgement.

GUSTAF SODERBERG, Chairman

COLONEL H. J. HANSJOSTEN

For several years it has been our proud boast that every one of the 24 past presidents of the Supreme Society is living and in comparatively good health. Just before the close of the year however, the Second Past President of the A.E.S., Colonel H. J. Hansjosten passed away at the age of 66 years.

Born in Germany, he came to America and settled in Grosse Pointe, Mich. He attended school near there and later was a student at the Old University of Detroit. At the time of his death he was an executive of the Wolverine Tube Company.

In 1930 Mr. Hansjosten was elected President of Detroit Branch which position he held until 1935. In this period of the Branch's history W. W. McCord writes as follows in the annual program just issued—"This was a difficult period and President Hansjosten deserves great credit for holding the Branch together. You may recall that there was a depression with a great many people out of employment and in no shape to pay dues to anything. In addition through an unfortunate accident the Branch found itself broke and in debt. The marvel is that it did not disintegrate entirely, and it was probably due to the personal energy of the President that this did not occur."

Not wishing to tax his strength unnecessarily during the past few years, Mr. Hansjosten has not been as active recently in A.E.S. affairs. His passing is deeply regretted by those who had the privilege of his acquaintance in the days when the Society was younger, and in the advancement in which he had a prominent part.

To Mrs. Hansjosten, his daughter, two brothers and two sisters, the members of the A.E.S. extend their deepest sympathy in their time of sorrow and bereavement.

Here and There

NEWARK BRANCH CHRISTMAS PARTY

The Elks Club, Newark, was the scene of a gay party on Friday evening, December 20, sponsored by the members of the Newark Branch and their pals, the Ladies' Auxiliary. Past President of the A.E.S. and chairman of the evening's festivities, Horace Smith, introduced the President of Newark Branch, William T. Maguire who carried on from this point. President Fulforth was introduced as the first speaker and gave a short talk about the welfare of the Society, then followed short addresses by the President of the Ladies' Auxiliary, Mrs. George Reuter, Dr. Walter Meyer, and the Executive Secretary.

One of the most enjoyable features of the evening was the return of Past President of the A.E.S., Philip Sievering, to the branch after a long illness which kept him confined to his home. Mr. Sievering was called upon for a few remarks to which he promptly responded, expressing his pleasure at being back in the midst of friends again. A round of applause was given to both Mr. and Mrs. Sievering at which they both bowed their acknowledgment.

A turkey dinner was enjoyed by the 106 persons present, after which door prizes were given to the holders of tickets with the lucky numbers. These gifts were exceptionally handsome and practical and were donated by many of the supply houses and manufacturing companies in and around Newark. A beautiful R.C.A. radio was raffled off and was won by an out of town guest. Orchestra music was furnished by The Barnyard Boys and was thoroughly enjoyed.

To the other branches of the A.E.S. who have never seen the fine spirit of cooperation between the ladies of Newark Branch and their husbands, may we say that this feeling of good fellowship might prove helpful in some other places. The men and women hold their meetings the same evening and at the close all get together for a social time and a bite to eat. The Newark ladies have helped their branch in many ways. They have our hearty commendation and our hope that other units of the A.E.S. will eventually follow their example.

Prominent in the evening's activities in addition to those mentioned were John Kotches, Paul Oldam, Ray Stout, George Reuter, Sam Taylor, the Honneckers, father and son, Nelson Sievering, George Klink, Fred Gumm, John Gumm, Tom Haddow, and George Wagner.

The following ladies were present: Mrs. George Reuter; Mrs. Nelson Sievering; Mrs. George Klink; Mrs. Horace Smith; Mrs. George Wagner; Mrs. John Kotches; Mrs. William Bruhns; Mrs. Fred Gross; Mrs. Fred Gumm; Mrs. Roy Stout; Mrs. William DeVoti, Mrs. Philip Sievering; Mrs. Anthony Calabrese; Mrs. Chris Kuell; Mrs. Roland Doucette, Mrs. William Hodecker, Sr.; Mrs. Paul Oldam; Mrs. Thomas Haddow; Mrs. Peter Labash. There were numerous other ladies, non-members of the Auxiliary including Mrs. Fred Fulforth and Mrs. W. J. R. Kennedy.

THE COPPS ARE IMPROVING

The many friends of Mr. and Mrs. Arthur Copp and daughter, Alma, will be pleased to know that they are getting along nicely at the Framingham, Mass., hospital.

A serious automobile accident on the night before Thanksgiving is the reason for their prolonged stay there.

Mr. Copp has charge of plating at the Moore Drop Forge Company in Springfield, and is an active member of the local branch. He wants us to express his sincere thanks to his many friends for their kind remembrances.

BRIDGEPORT HONORS WILBUR GEORGE STRATTON

Born on November 6, 1865, as Wilbur George Stratton. Started to work during vacation periods from school in 1880 for his father, who was then the plater for the Bradley and Hubbard Company in Meriden, Conn. Took the job as a regular man in 1883 and has been in the plating industry since that time up to his retirement in 1938. His first work was chandelier and ornamental goods including candlesticks and church service goods. 13 hours a day were the regular working hours including all day Saturday. He always took much interest and pride in plating and knows most of the leading men in this industry and still attends meetings here at Bridgeport.

He was a member of the New York Branch and later organized the Bridgeport Branch of which he is a charter member. Elected Supreme Vice-President in Dayton, Ohio, in 1915 when Colonel Hansjosten was elected President, who, we are sorry to hear, died recently. In earlier years he attended most of the conventions that were held in various cities of the United States. His wife, Jane Stratton, died in 1938 whose loss he feels keenly.

Knowing Mr. Stratton for many years, George Hogaboom writes of him: "Bill was a true pioneer in the plating game, a friend and helper to everyone whom he thought he could assist. Always as he is today, a gentleman, a good plater, and an invaluable friend."

Everything that Bill started to do was done with a master stroke of one who knew the plating game. Everything he knew was at the request of every other plater. He withheld nothing and often volunteered information when he heard that a fellow plater was in trouble. He gave what he had freely to all.

At an old timer's night in his honor held at Bridgeport, December 7, the boys from Connecticut got together to talk over old times. Dr. Walter Meyer spoke about Mr. Stratton's connection with the A.E.S., and presented him with a gift from the members of Bridgeport Branch. Others who spoke of their close association with Mr. Stratton were Messrs. Flaherty, Kusterer,

Thompson, John Oberender, Ray O'Connor, Gene Phillips, and William Ehrencrona.

Bill thanked the Society and his many friends and spoke briefly stating that he was overwhelmed with the reception and the gift presented.

CELEBRITIES TO SPARE

On page 944 of the December REVIEW I find a picture of Ken Bellinger of Hartford. As I find no article by the same Ken Bellinger which would justify this picture, am I to assume you are merely showing off his handsomeness?

I am sure there are plenty of A.E.S. members just as good looking as anything Hartford has and would like to suggest the following members for a picture gallery to be published in future REVIEWS. After all why discriminate?

1. The Binghamton Cutee—Austin Fletcher
2. The Rochester Oomph Boy—Cecil Trembicki
3. The Cleveland Sylph—John Honnecker
4. The Elyrian Nymph—Cliff Wheeler
5. The St. Louis Fan Dancer—Burton Daw

and for any special edition,

6. The Boston Eyeful—Bert Hedy Sage

Just the mention of these fugitives from Hollywood should convince Hartford that they have no monoply on the Robert Taylors of the A.E.S.

GEORGE SIMMONS

(Messrs. Simmons and Bellinger are good friends. George is simply introducing more celebrities.—*Ed.*)

OLD TIMER'S NIGHT

At the conclusion of Old Timer's night December 7, Bridgeport Branch was entertained with some fine pictures of camping and fishing with Mr. Earl Couch of the Waterbury Branch operating the projector. We also viewed some pictures taken by Mr. Robert Leather on his trip to the West Coast showing such western scenes as animal grazing, Boulder Dam and Death Valley, the home of the hermit "Death Valley Scottie." We wonder if we could be a hermit if we had all his money. The picture shows the Valley to be 279.6 ft. below sea level and danger signs reveal that the water is bad There are tremendous borax deposits in this section. The pictures gave us a fine view of the mountains and we are sure Bob must have had a wonderful trip. Thanks for the pictures, Earl and Bob. Then we had pictures of seal hunting in the Faroe Islands which proved highly interesting. It is a dangerous job to catch seals but we poor men and animals would do anything to keep our women folks happy. After the pictures, we settled down to enjoy our food, refreshments and "bull sessions," all of which were plentiful. The 47 men present enjoyed the affair immensely.

DEATH OF HARRY R. MAC FADYEN

Harry R. MacFadyen, 63, of 9 Forest Street, Hartford, Conn., died suddenly at his home Tuesday evening, January 7, 1941.

He was foreman in the plating department of the Arrow-Hart and Hegeman Company for 33 years and was an active member of the Hartford Branch.

Mr. MacFayden was born in Brooklyn, New York, and lived in Hartford for 45 years. He is survived by his wife, three daughters and a son. His death removes from A.E.S. circles one of the prominent men in the plating field. He was widely known, and until the last few years was regularly in attendance at the annual conventions of the Society. Poor health, however, had curtailed his activities recently. Our deepest sympathy is tendered to Mrs. MacFayden and family in the loss of their husband and father.

Regarding the Plated Ware Exhibit to be shown at the NATIONAL CONVENTION in Boston, Mass., June 9-10-11-12, 1941, the following specifications and suggestions should be adhered to as nearly as possible.

1. Articles to be displayed should be mounted on 4 x 3 foot size panel boards, covered with black cloth, the 3 foot ends are to be top and bottom.
2. Any amount of panel boards will be accepted either as individual or group combinations.
3. Name of electroplater, branch and firm connection should be attached to the board.
4. Wherever possible parts should be securely fastened to the display board.
5. Articles are to be numbered in rotation on the board, for identification in the contemplated reference book.
6. Reference Sheets: Formulas and the sequence of operations concerning the finished article should be typewritten on standard size 8½ x 11 inch paper, allowing 1½ inch margin on the left hand side.

EXAMPLE: Articles numbered 10 on your display board will be paged in the loose leaf reference book containing all the other exhibitors data, when found under your branch heading it should read thus:

Article . . 10
Name of Article . . HUB CAP
Base Metal . . COLD ROLLED STEEL
No. 1 Plating . . NICKEL; give formula and operating conditions, C/D., etc.

Any other information in regard to the finish, included on the reference sheet will be appreciated.

Regarding the shipping instructions, the exhibits should be packed and shipped PREPAID in cartons which can be opened and stored and used for the returning of the exhibit to the branch. All unpacking and setting up of the exhibits will be done by the Boston Branch, as well as the repacking and the return shipping.

Address your cartons to the AMERICAN ELECTROPLATERS' SOCIETY, HOTEL STATLER, BOSTON, MASS. Shipping should be made in time to reach Boston by June 1st. Prepaid charges will be repaid to the branches submitting exhibits and the exhibits will be returned with the charges prepaid by the Boston Branch.

The panel boards are to be displayed behind a table space 3 feet wide so that articles that must be displayed on a table can be accommodated.

According to communications received from different branches, it would seem that Boston is to have a 100% branch exhibit.

A. J. MINTIE,
Chairman National Exhibit Committee.

NEW ENGLAND REGIONAL EDUCATIONAL SESSION AND BANQUET

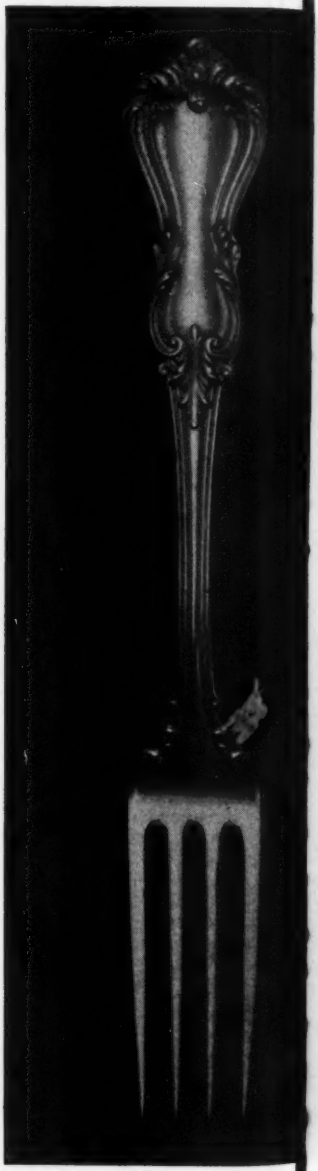
On Saturday, December 11, representatives of the Bridgeport, Hartford, New Haven, Springfield and Waterbury Branches met at the Hotel Elton, Waterbury, to arrange for the annual meeting, which will be held at the Stratfield Hotel, Saturday, May 3. Ray O'Connor, Bridgeport, was elected general chairman, Joseph Sterling, secretary, and Apley Austin of Terryville, treasurer. The program and advertising will be handled by the New Haven Branch. Publicity, Springfield Branch, Educational, Waterbury Branch. The following were present at the meeting: Bridgeport, J. E. Charleson, Joseph Sterling, Dr. Walter Meyer; Hartford, Apley N. Austin; New Haven, T. Chamberlin, Clarence Garner; Springfield, J. Costigan, D. S. Hartshorn, W. J. R. Kennedy; Waterbury, E. T. Candee, Spencer Henn, Ralph G. Coulter.

Exquisite

No other word can so well express the fineness of detail in this

Marlborough
Sterling Silver

a beautiful example of English Georgian silver, inspired by the period in which the Duchess of Marlborough was so outstanding a figure.



Interesting, too, is the fact that Reed & Barton craftsmen rely upon

THE LEA METHOD OF FINISHING

That the LEA METHOD is used on this renowned Reed & Barton silverware is a tribute to its adaptability, effectiveness, and economy.

We suggest you look into the merits of this versatile method of finishing for your problem — regardless of pattern, metal, or finish.

THE LEA MFG. CO. Waterbury, Conn.

Specialists in the Production of Clean-Working Buffing and Polishing Compounds

Business and Social News

BRANCH NEWS

Educational Activities

AMERICAN ELECTROPLATERS' SOCIETY

Waterbury Branch-Hartford Branch held a joint meeting at the Hotel Elton, December 13 at 8 p.m. It was the largest and most enthusiastic meeting held in some time. Fifty-one sat down to dinner at 6:30 and one hundred and two were present at the meeting. There were several out of town guests, among them Mr. George Hogaboom, Mr. Critchfield of the Lancaster Branch, and Dr. Walter Meyer.

The Supreme Secretary, Mr. W. J. R. Kennedy spoke on plans for the next regional meeting which will take place in March or April.

Dr. Dubpernell reviewed the new book "Lacquer and Synthetic Enamel Finishes" by R. C. Martin. The author confines himself almost entirely to a discussion of the use of nitrocellulose and cellulose acetate in lacquers, very little information being given on some of the newer materials. There are several excellent chapters but in general the book does not go into much detail.

Introducing the speaker of the evening, George Heinrich informed us that Dr. J. E. Stareck received his Ph.D. from the University of Kansas, that he has been with United Chromium Corporation at its Waterbury plant since 1935, and in 1939 was awarded the Edward Longstreth medal for his work on Electrocolor.

Dr. Stareck pointed out that numerous chemical dips and solutions have been used for years to color metals. They were limited however by the instability of the bath, lack of uniformity of the color, and the relatively few colors that could be produced.

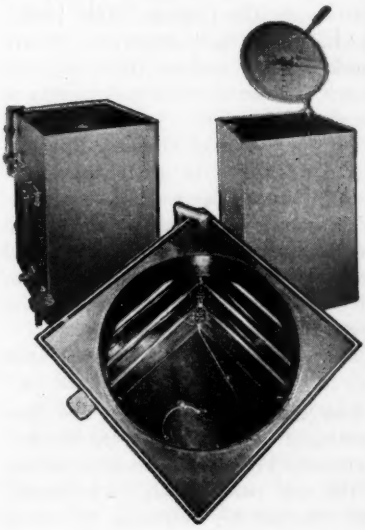
In this new process of Electrocolor an almost unlimited range of colors can be produced from one solution without any changes taking place in the solution itself, the color produced being primarily a function of the length of time the article remains in the plating bath. The plating bath is an alkaline organic copper solution operated at low voltage (½ volt) and the temperature may be varied from 70° to 110°. As the temperature is increased the plating time is shortened. Current densities are low and may be varied from ¼ to 3 amp./ft.^{2}. The cathode efficiency is 100%. The complex copper ions are reduced and the cuprous ion is deposited as the oxide at the cathode. The color obtained is a result of interference to light as it passes through the electro-deposited coating. A very thin film produces violet and as the thickness of the film increases the color changes to blue, green, yellow and finally to red. Inasmuch as the thickness of the film determines the color the solution must have excellent throwing power. This was well demonstrated by a clock case which had exactly the same shade of color on the inside as on the outside. These colors are light fast and resistant to heat. The heavier deposits may be buffed and relieved.

In Patternplate the film of copper oxide is reduced. This film being a semi conductor breaks down into small nuclei and then builds up patterns. The size of pattern is controlled by the

Vortexeddy

THE STORTS WAY of RINSING WITH SPRAY

MAKES EVERY DAY A COST-CUTTING PAY-DAY



YOUR NEAREST UDYLITE OFFICE WILL GLADLY AND PROMPTLY SERVE YOU

THE UDYLITE CORP., DETROIT, MICH.
The Udylite Corp., Chicago, Ill.
The Udylite Corp., New York, N. Y.
The Udylite Corp., Cleveland, Ohio
J. C. Miller Co., Grand Rapids, Mich.
Donald Sales & Mfg. Co., Milwaukee, Wis.
L. H. Butcher Co., San Francisco, Cal.
L. H. Butcher Co., Los Angeles, Cal.
MacDermid Inc., Waterbury, Conn.
Electroplating, Inc., Atlanta, Ga.
F. H. Bathke, St. Paul, Minn.

The No Obligation Booklet Telling Why, Is Yours For the Asking—Write For It WITHOUT DELAY TODAY

STORTS WELDING COMPANY

42 STONE STREET MERIDEN, CONNECTICUT

Manufacturers of Welded Fabrications to Specification

length of time in the reducing bath. Small patterns are produced in five minutes while the largest size takes 10 minutes. Very beautiful and varied effects may be obtained by plating colors or plating various metals over the patterns. The adherence of the deposit to the base metal is excellent, it being possible to bend, form, punch or shear without affecting the plate.

A number of questions were asked relative to the process. The exhibit of articles provided largely by Manning-Bowman Company illustrated the depth of color, richness and variety of finishes obtainable.

Mr. E. A. Farr of Manning-Bowman Company spoke of their experience with Electrocolor and Patternplate. With proper supervision and careful working out of details they have experienced no difficulty in production, while the acceptance of the trade is instantaneous and enthusiastic.

SPENCER L. HENN, *Secy.*

Los Angeles Branch. The last meeting of 1940 was held at the Rosslyn Hotel with President Bedwell presiding.

The next meeting will be a Smoker and Membership Meeting to boost the Branch membership.

Frank Rushton was appointed Chairman of the Committee in charge of the next meeting. Also on the committee are C. C. McLaren, Earl Coffin, M. D. Rynkofs, B. Schindler, E. Holman, D. Bedwell, and E. Frauenhoff.

M. D. Rynkofs was appointed Chairman of the Committee in charge of the Annual Educational Meeting to be held in March, 1941. He was also told to call on any of the other members for assistance.

Joe Handley, in charge of plating for the Government in Honolulu, was a visitor at this meeting.

The long awaited moving pictures of the Branch Picnic were shown. Alex Regmunt was the projectionist. The pictures were enjoyed and approved by all.

The Librarian then read a paper by G. Hogaboom, "Plating Economy Demands Control of Dragout Losses From Plating Solutions," which the members found very instructive.

ERVIN FRAUENHOFF, *Secy.*

Chicago Branch held its 344th regular meeting December 14, at the Atlantic Hotel.

Mr. Helbig, of the Darco Corporation, New York Branch, was a visitor, and brought greetings to the Chicago Branch. He reported, upon questioning, that Mr. Barrows of Toronto, is now well, and again attending Branch meetings.

It was reported that our member,

EXPERIENCED ELECTROPLATERS
prefer
ANACONDA
Copper Anodes
... because their unexcelled purity assures uniform corrosion, the highest quality deposit in the shortest possible time and low scrap losses. Furnished with suspension holes drilled as desired, or tapped for end hooks.
ANACONDA
THE AMERICAN BRASS CO.
General Offices, Waterbury, Conn.
Offices and Agencies in Principal Cities

Mr. C. S. Tompkins, was ill, and will appreciate hearing from any of the members by mail. His address is 7020 Jeffery Blvd., Chicago, Ill.

Regarding preprints of convention papers, it was voted that unless preprints of convention papers be sent out three months ahead of convention for study and discussion, in order to have benefit of the discussion at the convention, it was useless to have preprints; and that there was no choice whatever between preprints and proceedings—the proceedings are desired without question; also that it is the wish of the Chicago Branch to have the proceedings of the business sessions printed and sent along with the regular proceedings, to all members.

Mr. Joseph B. Niles, of the Thomas J. Dee Company of Chicago, spoke on "Electrodeposition and Uses of Precious Metals," and was very well received by the members; the discussion evoked thereby brought out some very worthwhile points.

Question Box: *Q. New cadmium Solution in new tank. Cd* 2.5 *oz/gal. Free CN* 10 *oz/gal. Free caustic* 2 *oz/gal. Temp.* 70 *F. Work plates spotty and greasy. That which does come out clean, will water break when dipped in cold water, and will not plate clean if again put in tank. Why?*

A. Believe lead impurities in CdO. Continue to use, and impurities will plate out.

E. A. LANZ, *Secy.*

Toronto Branch held its January meeting at the King Edward Hotel. President Archie Smith opened the meeting with a good attendance and introduced Mr. S. H. Dowdell and Mr. A. Robinson of the Canadian General Electric Company who were to show us pictures on an "Excursion in Science and Magnetism."

Applications for membership were received from Mr. W. J. Rennie and Mr. James Fullerton.

Tom O'Keefe, Kemish, Graham, Medina, and Boaz were appointed to look after the annual card party to be held some time in March.

Mr. Acheson spoke on the joint meeting of the Toronto-Buffalo branches to be held February 8 at the Foxhead Inn, Niagara Falls, Ontario. This will be an outstanding event. The speakers are Mr. George Hogaboom, Mr. Mesle, Mr. Oplinger, Mr. West, with Mr. Dribble showing moving pictures.

"AHCO"
GRINDING COMPOUND

Saves up to 50% of the time required for barrel grinding of small parts, producing a better surface for subsequent burnishing than can be obtained from the usual methods of wet grinding.

Ahco Burnishing Compounds produce a high lustre in a minimum of time.

Write for complete information.

APOTHECARIES HALL COMPANY
Est. 1849 WATERBURY, CONN.

AIRWAY *Ventilated* BUFFS

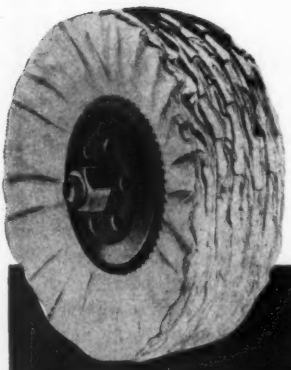
To the Executive.
To the Purchasing Agent.
To the Polishing Room Superintendent.

Gentlemen:

It may be you don't even know what we are talking about because you have never used **AIRWAY VENTILATED BUFFS**, but that's no excuse. If you buy **AIRWAY VENTILATED BUFFS** then you will know what we are talking about when we say we will save you 50% on your cotton buff wheel costs.

JACKSON BUFF CORPORATION

L. W. MACFARLAND
President.



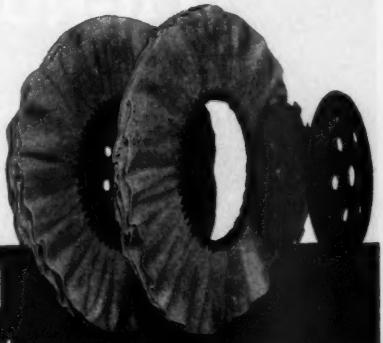
JACKSON BUFF
21-03 41st AVENUE

AIRWAY *Ventilated* BUFFS

We claim 50c on the dollar saving. We don't care whether it is $1000 or $10,000. You can't with safety challenge that statement. We can with safety make it.

Warning Notice

Jackson Buff Corporation of Long Island City, New York, has rights to U. S. Patents Nos. Re 19,894 and 2,140,208 which have broad claims covering an air-cooled buff having means for the admission of air through the sides of the buff. Owner intends to protect all rights and stop infringement.



CORPORATION

ONG ISLAND CITY, N.Y.

Mr. Dowdell and Mr. Robinson showed the members the most wonderful and phenomenal pictures they had ever seen. Electric cars stopping and going, doors opening and shutting as if they bowed to the will of the person.

The manufacture of electric light bulbs and tubes by machinery that acted more than human, showed the mysteries of magnetic power which belong to the future, which will be harnessed by someone. Perhaps he may be a plater.

JAMES S. CAIRNS, *Secy.*

Baltimore-Washington Branch held its December meeting on December 14, at the Telford Buffeteria in Washington. The rather novel arrangement for us of having a dinner in conjunction with a regular monthly meeting drew an unusually good attendance, and proved so popular that two similar meetings were voted, one in Washington on January 4 and one in Baltimore on the first Saturday in April. With our big annual meeting and banquet scheduled for February 8, our members should be well fed in 1941.

It was voted to hold the annual meeting at the Hotel Continental near Union Station, Washington, D.C. With the entertainment handled by Tom Slattery, the educational session by Dr. Brenner, and general arrangements by Chairman L. L. Turner, this should be a large affair, and we hope that our out of town friends will be well represented.

After routine business had been dispatched by our presiding officer, Mr. C. C. Beetham, Dr. Blum doubly deserved his dinner, first winning the draw, and then by a brief interesting survey of the whole field of electroplating in a talk on "What Metals Can be Plated from Aqueous Solutions?" You'd be surprised. We were.

The January meeting was held on the fourth at the Telford Buffeteria, Washington, D.C., repeating its recent popular dinner and meeting combination. Although some members were kept away because of night work, there was an attendance of 22 to hear our new A.E.S. Research Associate at the National Bureau of Standards, Mr. Gerald A. Lux, who spoke on "Cleaners, Their Composition and Properties." Both his talk and demonstrations were of great interest to all present. Our popular Committee on Arrangements for the annual meeting and banquet,

MAGNUS PRODUCTS
Tested and Proven for the Plater's Needs in
PRE-CLEANING
CLEANING
POLISHING
FINISHING
MAGNUS CHEMICAL COMPANY
41 South Avenue Garwood, N. J.
Magnus CLEANERS

One for the Book!

A metal finishing plant is using Wyandotte C. S. R. cleaner for cleaning polished steel stampings prior to bright nickel plating directly on the steel.

The method: No cyanide dip or copper strike in the line. Parts are assembled in jig, and after bright nickel plating, followed by chrome plating, they are spot-welded with absolutely *no lifting of the plate.*

Your Wyandotte Representative will be glad to show you what Wyandotte C. S. R. can do for you. Write us.

Wyandotte SERVICE REPRESENTATIVES IN 88 CITIES
THE J·B·FORD SALES CO· WYANDOTTE MICH·

IS THE DAY TOO SHORT?

Save Time By Sending Your Solutions To Us For Analysis. Immediate Accurate Report By Air Mail.

NICKEL SOLUTIONS
Nickel, Chlorides
Boric Acid, pH
COPPER SOLUTIONS
Copper, Free Cyanide
Carbonates, pH
ACID COPPER
Copper, Sulfuric Acid
$1

ROCHELLE COPPER
Copper, Rochelle salts
Free Cyanide,
Carbonate, pH
BRASS SOLUTION
Copper, Zinc, pH
Free Cyanide,
Carbonate
$1.50

Other Solutions & Other Ingredients At Equally Low Prices
Send a 4 oz. Bottle by Parcel Post or Prepaid Express

KOCOUR CO.

4724 S. CHRISTIANA AVE. • CHICAGO

★ ★ ★ SPECIALISTS IN SOLUTION CONTROL ★ ★ ★

Messrs. Turner, Slattery, and Brenner, reported that all preparations were made for that big event of February 8, next. Mr. Sam Warnock was appointed chairman of a committee to consider exhibits for the Boston Convention. The lucky dinner draw fell to our deserving Librarian, Dr. Brenner, who thereby proved himself a bad one to play poker with. Also helping to prove that a Ph.D. is really worthwhile, with a score of two out of two.

C. T. THOMAS, *Secy.*

Dayton Branch held its regular meeting at the Dayton Engineers Club on Friday January 3. The meeting was called to order by Mr. Cochran and turned over to Mr. Wise who introduced our speaker for the evening, Mr. W. A. Helbig of the Darco Corporation, whose subject was "Activated Carbon in Plating Solutions."

Beginning with the true meaning of Activated Carbon, its structure, and properties, Mr. Helbig covered the manufacture of the material, describing the process used and some of the raw materials from which it is made. The different methods used to purify plating solutions were discussed. The periodic filtering in which the solution is taken to an auxiliary tank and carbon mixed thoroughly into it and then run through the filter, which takes out the carbon along with the matter which has been trapped by it. Continuous filtering was described as an insurance against loss of production time and money due to bad work. In this method the carbon is deposited on the filter in the form of a cake, the solution then being pumped from the tank through the filter and back into the tank. In this method only about one pound of carbon per hundred gallons of solution is needed as against three to five or more in the periodic method. On the average this will protect the hundred gallons for a period of about two weeks.

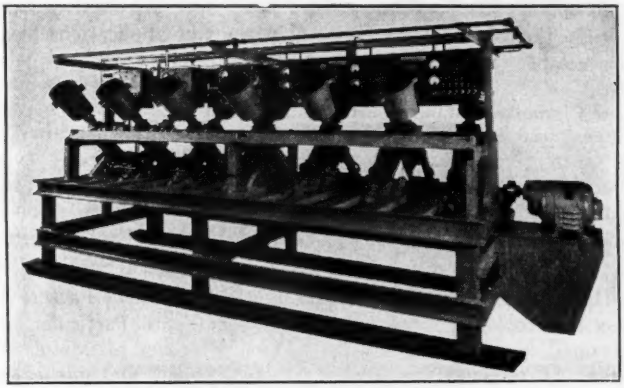
Three applications were acted upon at this meeting, Mr. Herbert Brown and Mr. F. H. Thompson being elected to associate membership and the application of Mr. Lloyd Huey voted to take the usual course.

On February 14 Mr. George Hogaboom will present his discussion "Information Please."

CORLISS W. POWELL, *Secy.*

Besplate
NICKEL ANODES
AND
McGEAN CHEMICALS
for Better Nickel Deposits and Greatest Satisfaction
USED BY THE LEADERS IN THE INDUSTRY
THE McGEAN CHEMICAL COMPANY
CLEVELAND, OHIO

The MUNNING
VARI-MATIC 12 BARREL PLATING MACHINE
for Producing Different Finishes on Odd Lots of Small Work



¶ Each Barrel has its own Rheostat for controlling the Plating Current

¶ Many Different Metals may be plated Simultaneously on this Machine

A complete twelve unit barrel plater for the finishing of screws, bolts, nuts, washers and all small articles in any metal which may be electrodeposited in this manner.

This machine is simple, rugged and self contained. Make two bus bar connections, then hook up the motor and the machine is ready to run.

The barrels are of steel, rubber lined, readily removable and may be started and stopped independently.

Machines are available in 4, 6, 8 and 10 tub units, as well as the 12 unit machine illustrated above.

MUNNING & MUNNING, Inc.

Engineers Specialists in the MUNNING *Manufacturers* Metal Finishing Field

Main Office and Plant, 202-208 Emmett St., Newark, N. J.
NEW YORK PHILADELPHIA WOONSOCKET, R. I.

Grand Rapids Branch held its regular meeting on December 12 at the Rowe Hotel, President Maurice Caldwell presiding. This Branch voted in favor of preprints of National Conventions to be printed as usual and mailed to the members of branches before conventions so that all members will have an opportunity and time to read and study them in advance.

One new member, Jack J. Hanney, was elected.

Reports of Committee on our Fourth Annual Educational Session and Dinner-Dance were given, showing excellent progress being made on arrangements for this annual event.

Mr. Bogle of Udylite Corporation was introduced as speaker for the evening. His subject, "The Place of Rectifiers in Electroplating," was well given and questions and discussions took place about rectifiers and their applications.

C. E. ABEL, *Secy.*

New York Branch held one meeting during the month of December, on Friday, December 13, at their headquarters in the Hotel Pennsylvania. This was a business meeting at which plans for the coming Founder's Day Banquet and Technical Session were discussed. This was followed by a Forum on current developments in bright nickels, bright coppers and bright zinc processes. After an hour and a quarter debate, pro and con, the meeting adjourned so the members might get together for a pre-Christmas party, arranged impromptu because of the cancellation of the second meeting of the month.

There were two elections to membership and five applications filed at this meeting.

F. J. MAC STOKER, *Secy.*

Detroit Branch held its first meeting in 1941, a successful event with approximately 200 members and guests in attendance. The program included a talk by Mr. Paul Soderberg, Director of Technical Service, J. B. Ford Company, on "Some Factors Affecting Detergency with Particular Reference to the Cleaning of Metals Prior to Electroplating," and movies from the Bureau of Mines showing the mining, smelting and refining of nickel.

Mr. Soderberg brought out the fact that practical tests should go hand in hand with good laboratory control; detergency of a solution is not determined by pH; "active or inactive" alkali, alkali pressure or surface tension measurements; and a good cleaner is one which removes the dirt or oil from the surface, and then prevents it from re-adhering or otherwise contaminating

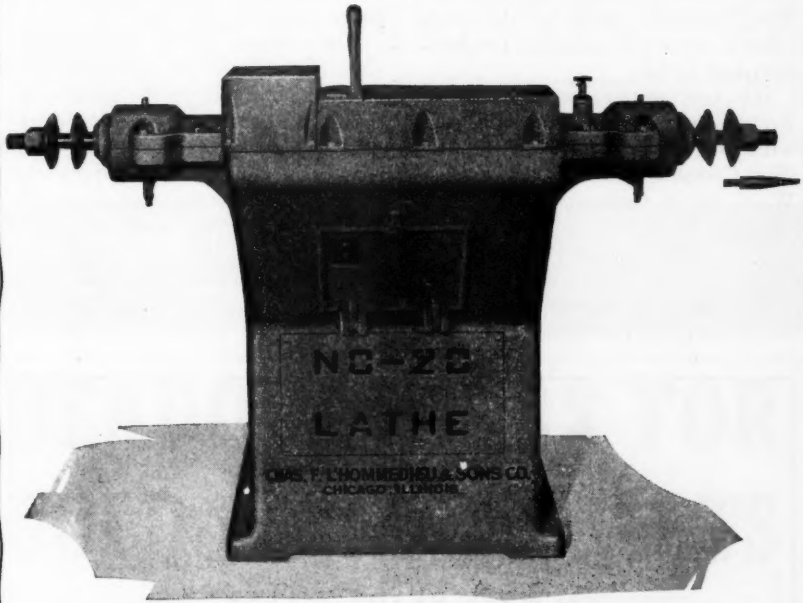
POLISHING WHEELS

That *really* polish faster
That *really* last longer
That *really* produce finer finishes.

Divine Brothers Company

62 Whitesboro St. • Utica, New York

Variable Speed Lathes Lower Your Buffing Costs



ANY SPEED FROM 1800 to 3000 R. P. M. INSTANTLY.
ALL TYPES AND SIZES.
WRITE FOR PARTICULARS.

Chas. F. L'Hommedieu & Sons Co.

MANUFACTURERS

Gen. Office and Factory:
4521 Ogden Ave.
Chicago
Dealers in Principal Cities

Branches:
Cleveland, Los Angeles
Wm. R. Shields,
Detroit

COMPLETE PLATING PLANTS INSTALLED

the same surface. Part of the talk concerned the troubles encountered in taking pH, the magnitude of the errors and the difficulty in getting check readings on the same solution by different operators.

The question box was run as successfully as in November, with Mr. Paul Strausser, Mr. Gustave Soderberg, Mr. Chas. Eldridge, and Mr. Paul Soderberg sitting at the round table to answer all questions the members had to ask.

Our next meeting will be held on Friday, February 7, at Hotel Statler, with Mr. Anderson of New Jersey Zinc Company, and Mr. Caldwell of W. B. Jarvis Company telling about "Electroplating of Die Castings."

WRIGHT WILSON, *Secy.*

Springfield Branch held its December meeting at the Hotel Charles on the twenty-sixth at 8:00 P.M. The meeting was called to order by President Costigan.

The secretary read an appeal from A. W. Collins, Chairman of the Educational Committee for the Boston Convention for a branch paper and papers from members of the Springfield branch. The appointment of members to the Papers Committee was postponed until the next meeting.

Everyone was glad to hear that Mr. Copp and his family have improved and are now well on the road to recovery. It was voted that the Society send them flowers just before the Christmas Holidays. An application for associate membership from Mr. J. F. Buckman was read and placed on file.

It was decided to postpone final plans for the plating class until the next meeting. The secretary will mail

NUGLU

THE LIQUID COLD GLUE
FOR SETTING UP POLISHING WHEELS
ALWAYS READY TO USE

POLISHERS' BRICK

BETTER THAN LUMP PUMICE
THE HIGH ABSORBING QUALITY
OF THIS BRICK MAKES IT IDEAL TO USE

J. J. SIEFEN CO. DETROIT

How you can always tell true Buff Value

Each BIAS Buff made by this company bears a plain registered trade mark like this:—

THE BIAS BUFF

Back of that mark is the highest type of workmanship — the best cotton cloth possible to obtain, which is bias cut and formed, insuring against waste in either cloth or polishing compound.

BIAS Buffs have been made by our company for more than 20 years. The price has always been low when quality and service are realized.

Once used they are never rejected by the operator. Give them a trial in your polishing room. We also make BIAS Ventilated Buffs.

The BIAS BUFF *and* WHEEL CO., Inc.
430 Communipaw Ave. Jersey City, N. J.

HEADQUARTERS FOR GOLD & SILVER SALTS

Merck Gold and Silver Salts are manufactured carefully and by precision methods. The finished products must undergo a score of separately conducted tests. Even minor metallic impurities are removed entirely or reduced to insignificant limits.

Prices Will Be Mailed on Request

The Merck line includes:

GOLD

Bromide — Tribromide
CYANIDE — CHLORIDE
& Potassium Cyanide
& Sodium Chloride
& Sodium Cyanide

SILVER

Precipitated — Acetate
Bromide — Carbonate
CHLORIDE — CYANIDE
Iodide — Sulfate
OXIDE — NITRATE

MERCK & CO. INC. *Manufacturing Chemists* **RAHWAY, N. J.**
New York — Philadelphia — St. Louis

reminders with self-addressed return cards to the members so that the committee will have an idea of the subjects which the members are most anxious to have covered in the class.

Because of the dangerous driving conditions Mr. Hogaboom, our scheduled speaker, was unable to appear. In place of the program planned, a question and answer period was held with Art Wood and Bill Seidel serving as oracles. They did an excellent job of answering all kinds of questions for the perplexed platers.

D. S. HARTSHORN, *Secy.*

Newark Branch held its regular meeting on Friday evening, December 6, at the Hotel Douglas, Newark. The meeting was called to order at 8:15 P. M. with President William T. Maguire presiding. Other officers present were George Wagner, Roy Stout, Horace Smith, John Kotches and Paul Oldam.

An application for Mr. William Kolowitz of the Thomas and Betts Company to active membership was voted to take the regular course. Mr. Ernest Hinterleitner of the Frederick Gumm Chemical Company was elected to associate membership of Newark Branch.

Mr. Smith reported that the Banquet date had been changed to April 26, 1941, so as not to conflict with the Electro Chemical Society Convention which is scheduled to be held in Cleveland on April 19, 1941.

Mr. Paul Oldam, Acting Librarian, next presented Dr. Louis Weisberg as the Guest Speaker for the evening. His subject was "Hydrogen Absorption and Embrittlement in Electroplating." It was one of the most interesting talks of the season and at the conclusion Dr. Weisberg was given a rising vote of thanks by the 42 members present.

At the January third meeting Mr. James J. Monagle of Hanson-Van Winkle-Munning Company was elected to associate membership; Mr. Carl D. Chambers of Wilson Jones Company and Mr. Joseph P. Mickiewicz of Wright Aeronautical Company were elected to active membership.

Mr. Horace Smith reported that the Christmas Party was a huge success.

Mr. Louis Donroe reported that he was contacting speakers for the Educational Session and promised an interesting program. He next presented our guest speaker for the evening Dr. C. J. Wernlund of E. I. duPont deNemours Company. His subject was "A Study of Tin Plating Solutions." His talk dealt mostly with the Stannate bath but covered practically all of the Tin Plating Solutions from the time Tin was first deposited from an electrolyte. His talk was accompanied by colored slides and held the attention of the members for about 2 hours, after which the speaker was bombarded by numerous questions. All questions were answered to everyone's satisfaction.

GEORGE WAGNER, *Secy.*

Bridgeport Branch held its regular monthly meeting Thursday, January 2, at the Stratfield Hotel. Vice-President Charles McElroy opened the meeting.

A letter from Mr. Arthur J. Mintie in charge of exhibits at the Boston Convention asked for a committee on Plated Ware Exhibit. The following men were appointed by the Branch: Mr. Eugene Phillips, Chairman, Mr. George J. Karl, Mr. George Morrow, Mr. Fred Gotthardt, Mr. Ralph H. McCahan. Mr. Arthur W. Collins of the Boston Branch asked for papers for presentation at the Boston Convention. The Branch has selected Mr. Clarence C. Helmle to be chairman of

the Papers Committee for the Branch and he will assist any member of the Branch who wishes to present a paper.

A letter was received from Mr. LeRoy Beaver wishing us good luck and happiness for the coming year of 1941 and expresses his pleasure in the happy evenings he had with us. "We reciprocate, Roy."

The branch voted to contribute five dollars from the treasury for a Christmas Seal Bond.

A letter was received from Mr. Kennedy, our Executive Secretary, on preprints of papers at the convention. After a thorough discussion with the members of the branch it was voted to have preprints patterned along the same lines as those used at the Dayton convention in 1940. Mr. Kennedy also desired to have the President and Secretary attend a meeting of the New England Branch Presidents and Secretaries to be held January 11, 1941 at Waterbury, Conn., with the view of setting the time and place for the New England Regional Meeting which is a yearly function. The Branch voted to accept the annual New England session if it was offered to Bridgeport. Mr. R. J. O'Connor was unamimously selected as General Chairman.

An application for active membership was received from Mr. James Taylor Lumley, of the Contract Plating Company.

The meeting was turned over to Dr. Walter R. Meyer who discussed "Blackening of Aluminum." An interesting discussion followed.

JOSEPH G. STERLING, *Secy.*

See Historic Boston, Birthplace of American Liberty.

Plan Now to attend the greatest Convention in A. E. S. History.

June 9 - 10 - 11 - 12, 1941

HAMMOND of KALAMAZOO

RITE-SPEED POLISHERS

Single or Variable Speeds – 1 to 50 H.P.
A Model for Every Application.

HAMMOND AUTOMATICS
(Rotary and Strait Line)

High Production and High Quality Finish, Polishing or Buffing, are possible on HAMMOND Automatics. We build a complete line.
Send samples for prices and approximate production figures.

Hammond Machinery Builders INCORPORATED
KALAMAZOO, MICHIGAN, U.S.A.

Eastern Branch — 71 W. 23rd St., N.Y.C.

— CHICAGO BRANCH —

Annual EDUCATIONAL SESSION and BANQUET
2 p.m., on Saturday, January, 25, 1941, at the PALMER HOUSE

Industrial Applications for Gold
Joseph B. Niles, Research and Development Engineer
Thos. J. Dee Co., Chicago, Ill.

A Development in Full Automatic Silver Plating
Frank K. Savage, Research Chemical Engineer
C. G. Conn Ltd., Elkhart, Ind.

The Value of Lacquer Thickness
R. J. Hazucha, The Clinton Co., Chicago, Ill.

Generators and Rectifiers
G. J. Berry, Electric Products Co., Cleveland, Ohio

The Chicago Branch is again offering a program which is felt will uphold the prestige of the A. E. S. by being fortunate in securing speakers whose papers are not only practical but up-to-date as well, and we are happy to extend an invitation to anyone interested in this program, as well as to the banquet, entertainment, and dance in the evening—again making mention that all seats will be reserved, at a charge of $3.50 each. Letters announcing the opening of the seat sale for the evening affair will be mailed shortly, but I am mentioning this so that those who are inadvertently overlooked on our mailing list will have full knowledge of the new arrangement.

AMERICAN ELECTROPLATERS' SOCIETY
NEW YORK BRANCH

Founder's Day

CHARLES H. PROCTOR

Educational Session - Banquet - Entertainment - Dancing

SATURDAY, FEBRUARY 22 (Washington's Birthday)

HOTEL PENNSYLVANIA
7th Avenue and 33rd Street, New York City

An interesting and informative educational session

A fine dinner in the famed MANHATTAN ROOM

An entertaining floor show and an orchestra that will make you want to sing and dance

A week-end Holiday Party for the Metal Finishing Industry

Franklyn J. MacStoker, General Chairman

FORMAX

-for FINER Finishing

Formax Gives You The Positive Results That Spell A Time-Proven, Superior Product

Assure Top Results With Formax Tripoli ... White Finish ... Stainless Steel Compound ... Grease Stick ... Emery Cake ... Chrome Rouge Compound

Automobile Polish * Polishing and Buffing Compounds * Sanding Compounds * Rubbing Compounds

FORMAX MFG. COMPANY
3999 18th St. Detroit, Mich.

Quick Service and Courteous Attention to Needs is Our Only Excuse for Being in Business

But we are 25 Years Old

And Growing in Size Every Year

A. T. Wagner Co.

Plating Equipment and Supplies

2700 Wight St. Detroit

Fitzroy 3171

Used Buffs for Sale

64-68—1⅛" arbor—20 ply

Full Disc - Loose - or Sewed

Thousands of every size

8"—8¢ each 9"—9¢ each

10"—12¢ each

MICHIGAN BUFF CO., Inc.
4654 Beaufait Ave. Detroit, Mich.

pH PAPERS

FOR DETERMINING pH VALUES OF SOLUTIONS

ACCURATE RESULTS IN FEW SECONDS

Just dip strip of pH paper in solution and read off pH value. Can be carried in pocket. Always handy.

AVAILABLE RANGES

Acid:	*Alkaline:*
pH 5.2—6.7 (nickel)	pH 6.6— 8.1
3.6—5.0 (nickel)	8.2— 9.7
1.9—3.4 (copper, nickel)	9.2—11.0
0.9—1.5 (copper, etc.)	11.0—13.1
2.6—4.1 bright nickel	(brass, copper, silver, cadmium, zinc, tin, and cleaners)

Each Range is Separately Boxed.
(200 strips per box)

PAUL FRANK
456 Fourth Avenue New York City

The Abstract Section

CHARLES C. CONLEY, *Chairman, Program and Educational Committee*

Anodizing Aluminum. *Metals and Alloys*, August 1940, pp. 205-206, a composite. Details on several of the better known anodizing processes were given, such as sulfuric acid, chromic acid and oxalic acid. Sulfuric process is most generally used, containing 12%-20% of sulfuric by weight with addition of ammonium sulfate and glycerine to bath. Oxalic acid process used oxalic content of 3%-10%, with or without additions of oxalates, chromates and organics. Oxalic oxide films may be colored a light yellow, whereas sulfuric films are colorless. Trouble chart is especially interesting:

	FAULT	CAUSE	REMEDY
1	Iridescence	Thin film	Check contacts, temperature, time and amperage
2	Discoloration and pitting	Non-uniform structure	Heat treatment if mild or use of A. C. sulfuric process.
3	General pitting	Contaminated solution	Check solution analysis.
4	Brown stains	Chromic acid oozing from pores	Improve wash. Improve quality of base metal.
5	Red stains	Rouge from polishing	Change polishing compound.
6	C. D. Too high	Foreign metal at anode Short circuit, voltage too high	Check work set-up, voltage. Reduce temperature.
7	C. D. too low	Temperature too low	Check temperature, renew solution.

PHIL J. RITZENTHALER

Modern Gold Plating. JOSEPH B. KUSCHNER. *Products Finishing*, September 1940, pp. 30-39. Author discusses all types of gold plating, including immersion gilding, single cell plating, electrogilding from still tanks, conveyors and barrels. Gold provides dense protective coatings of extreme thinness and beautiful finish. The trend today is to make up solutions with prepared gold salts, instead of the plater dissolving his own gold. Data is given on common gold compounds available. Directions are also given for dissolving gold in aqua regia, and also by electrolytic method. Electrolytic method is quite rapid if solution of KCN is agitated by means of motor stirrer and is easier to do than chemical method. PHIL J. RITZENTHALER

Haunted Houses

..and electroplating solutions

Every electroplater believes in "ghosts." Not the Hallowe'en kind—but the grease, oil, soap, colloidal impurities, decomposition products and other "spooks" that ruin so many plating jobs.

GHOST-BREAKER No. 1 is DARCO S-51

. . . the activated carbon especially made for electroplating solutions. *Darco S-51 disperses "ghosts" like a shaft of sunlight. Gives you brighter work, too—without spots or dull finishes.

Darco S-51 wets easily—works quickly—costs little. One dime covers the cost of keeping 100 gallons of solution clean and "ghost-free" for almost a week!

We have a liberal sample waiting for your request. Or—get a supply from your jobber now.

*Darco Reg. U. S. Pat. Off.

DARCO

This trademark identifies the genuine. Accept no packages without it.

D A R C O
CORPORATION
60 East 42nd St.
New York, N.Y.

PAPERS FOR THE CONVENTION

In order that you may know what progress is being made in the matter of Speakers for the Educational Sessions for the National Convention, we are listing below just a few of them. The program is practically complete but a few of the speakers have asked that we withhold the actual name of the subject for a while longer and, therefore, we will, at this time, merely give you the names and follow it up a little later with the full list and the subjects:—

Carl A. Zapffe
Dr. Wm. Blum
Floyd Opplinger
W. A. Helbig
W. A. Phillips
James E. Dowd
C. Davidoff
George B. Hogaboom
C. B. F. Young
Dr. Walter Meyer
Mr. Oscar Stocker
Donald Wood
A. L. Feild
Branch Papers

As stated above, this list is only a partial one and others have signified their intentions of presenting papers. — EDUCATIONAL COMMITTEE

FALLS

Why do falls occur? What can be done to prevent them? A review of accident figures, as well as ordinary common sense, should indicate the desirability of reminding management, supervisors and employees to watch out for:

1. Grease, oil or water on floors and steps.
2. Loose or fixed objects on floors and stairs.
3. Loose material that may shift underfoot.
4. Uneven or defective floors.
5. Stairs with irregular or curving treads or winders.
6. Ladders with defective rungs, rails or steps.
7. All makeshift supports, such as boxes, barrels, chairs, tables, etc.
8. Unguarded floor openings and loose covers over floor openings.
9. Wet and slippery pavements and walks.
10. Blind corners and dark places; walking without looking ahead.
11. Shoes with worn down heels or loose soles.
12. Heels catching in trouser cuffs.
13. Leaning too far out of windows.
14. Failure to use safety belts and life lines when working in high places.
15. Hurrying on slippery or uneven surfaces, stairs or ramps.
16. Horseplay.
17. Failure to use handrail on stairs.

From *Occupational Hazards*, November, 1940

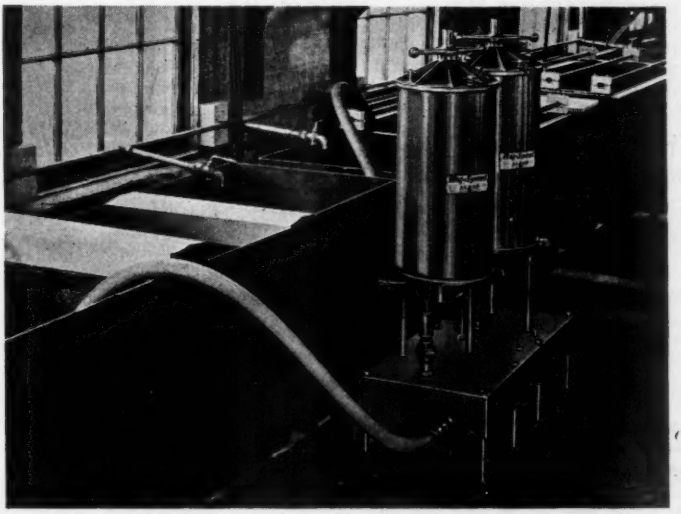
TIN FLUX

Gas-Tin-Flux is a liquid of the zinc chloride type for use in hot tinning, in the manufacture of Terne plate and in soldering. This material contains special addition agents to insure fast action. It is also free from uncombined hydrochloric acid, assures smoother coats, fewer pinholes or craters and long resistance to the salt spray test. May be poured on molten tin without danger of explosion. High concentration of solids (69%) enables the user to reduce the quantities used. Developed by the Hanson-Van Winkle-Munning Company.

PLATING TANK NETS

Nets made of ½" stretched mesh hung square, 6 thread medium twine are made to specific dimensions. These nets are placed in plating tanks so that any work dropped may be easily recovered by simply lifting the net out of the solution. Recommended for nickel, cyanide copper, Mazic zinc, acid zinc and cadmium solutions. The Hanson-Van Winkle-Munning Company of Matawan has this new equipment.

"Our Plating Solutions are kept Highly Clarified by the New Alsop Hy-Speed Filter Method"



—said the V. P. in charge of production and he added,—

"your filter does a finer job for our Bright Nickel solutions than any other method, and we have tried them all."

The Alsop "Hy-Speed" filter method is a new and revolutionary idea, the result of 20 years experience with filtration problems.

SMALL — Only a fraction the size of ordinary equipment.

CLEAN — Easily and quickly cleaned for a different solution.

FILTER DISCS — The heart of the job — most efficient filter medium yet produced.

PORTABLE — Easily moved from tank to tank.

RESULTS — All sediment and foreign matter completely filtered out by large filtering areas. Better Plating.

Send for the story of

"Why and How of Filtering Plating Solutions."

ALSOP ENGINEERING CORP.

2 Bright Street **Milldale, Conn.**

Offices in Principal Cities

STRIPPING COPPER FROM ZINC DIE CASTINGS

Some time ago, we set out to make a special copper stripping agent. We were going to call it McKeon's "COPPER OFF." It was found after an exhaustive survey, however, that the potential market for such an item would not be of sufficient volume to justify an effort to market a special product for this purpose. It was therefore deemed advisable to incorporate the stripping properties of McKeon's "COPPER OFF" into McKeon's "LIQUID SULPHUR." Impregnating McKeon's "LIQUID SULPHUR" with copper stripping properties has not in the slightest degree interfered with its oxidizing properties.

All you need to do to strip copper from zinc die castings is

1. Remove surface grease from work to be copper-stripped.
2. Immerse work in about 20% solution of McKeon's **"LIQUID SULPHUR"** (About one part of McKeon's **"LIQUID SULPHUR"** to four parts of water — about 25 ounces per gallon of water) at room temperature.
3. Rinse in cold water.
4. Immerse in about 10% cyanide solution. (Roughly about two pounds cyanide per gallon of water).
5. Cold water rinse.
6. Repeat this operation until all copper is removed.

This will not burn, etch or pit the finest zinc die casting. Further specific information for your particular job will be furnished without charge or implied obligation. This product is guaranteed to give you satisfactory results by Sulphur Products Co., Inc., Wilfred S. McKeon, President, Greensburg, Pa.

If you are opposed to the use of cyanide, just advise the makers. They will provide you with a made to order alkali cleaner for removing the copper sulphide or sludge which is left after the copper is removed from the zinc die casting. McKeon's **"LIQUID SULPHUR"** leaves the face of the casting in good condition. The adhesion of your plating may be even better after the use of McKeon's **"LIQUID SULPHUR"** than it was when the casting was brand new. The producers of this product stand ready to answer any and all questions you have at any time about copper stripping. The price of this product is still exactly the same as has always been the price of McKeon's **"LIQUID SULPHUR."** The guarantee goes with this product whether it is bought direct from the producers or from their jobbers. Let them hear from you in rather complete detail. They solicit any and all questions.

WE DIDN'T MEAN TO OVERLOOK THEM

A good friend of ours in Detroit has written to us regarding the report of the Detroit Branch Annual Meeting, which appeared in the December REVIEW telling us that three other members of the branch deserve recognition for the success of the party. We are more than pleased to add to the list already published the names of Eddie Fritts, Charlie Anger and Charlie Beubien. Please pardon the omission, boys. The nice things we said about the others is meant for you too.—*Ed.*

CLEVELAND WANTS THE 1942 CONVENTION OF THE A.E.S.

The Cleveland Branch members are not losing any time in seeking to entertain the members of the A.E.S. at the Annual Convention in 1942. Our good friend Past President E. Steen Thompson is one of the leading boosters. Each branch is being asked by letter to consider Cleveland when the decision comes up for action at the Boston Convention this year.

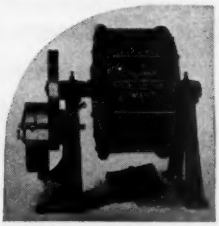
PLATING PLANT OWNER DIES IN KALAMAZOO

L. J. Nook, 50, proprietor of the Kalamazoo Plating works which serves much of the automobile industry, died Monday in Burgess hospital.

Death was attributed to a blood clot near the heart. Mr. Nook was stricken while attending mass at St. Augustine church Sunday.

for Better plated surfaces

Prepare for a fine plate first by burnishing small, metal parts. After plating, burnish again. That rolls down the surface, closes pores, increases resistance to corrosion. Pressure does the job. Therein lies the advantage of Abbott high, narrow barrels which take a charge of several hundred pounds of steel burnishing materials. This mobile weight, confined within an upright area, develops maximum pressure on the work. Questions gladly answered. Orders promptly filled.

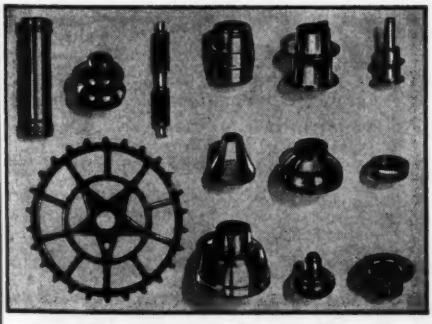


The Abbott Ball Company

"Burnishing and Cutting-down Barrels
Burnishing Balls and Materials"

1051 New Britain Ave. - Hartford, Conn.

Packer-Matic
Automatic
POLISHING & BUFFING MACHINES



VOLUME FINISHING AT A SAVING...

PARTS of varied shapes and sizes, in all types of industries are being efficiently and economically Finished on Packer-Matic—the modern method of Automatic Polishing and Buffing.

Three types of Packer-Matic—ROTARY, STRAIGHT LINE CONVEYOR and ROLL.

Actual "Time Study" on your PART gladly given, gratis. WRITE ENG. Dept. and send Part.

THE PACKER MACHINE CO. MERIDEN, CONN., U.S.A.

Membership Report

ELLSWORTH T. CANDEE, *Chairman, Membership Committee*

To January 1, 1941

ELECTIONS

John C. Rich, 48 Edgehill St., Providence, R. I. Associate, Boston Branch

Milton F. Haehnel, 23 Valley W., Grand Rapids, Mich.
Associate, Grand Rapids Branch

Jack J. Hanney, 835 Calvin, Grand Rapids, Mich.
Associate, Grand Rapids Branch

Ward Hubbell, % Kalamazoo Plating Works, Kalamazoo, Mich.
Active, Grand Rapids Branch

Leo P. Waite, 503 Kalamazoo Ave., Kalamazoo, Mich.
Active, Grand Rapids Branch

Edward G. Jennings, 999 Delorimer Ave., Montreal, Que., Can.
Associate, Montreal Branch

Angelo Amatore, 178 Hopkinson Ave., Brooklyn, N. Y.
Active, New York Branch

George F. Hermann, 52 Chestnut St., Brooklyn, N. Y.
Active, New York Branch

James Martin, 20-35 35th St., Astoria, N. Y. Active, New York Branch

Harry McFall, General Chemical Co., Technical Service Div., Edgewater, N. J.
Associate, New York Branch

Frank Briganti, 323 Avenue X, Brooklyn, N. Y. Active, New York Branch

Lincoln Abraham, % Hunt Pen Co., 7th & State Sts., Camden, N. J.
Associate, Philadelphia Branch

Kenneth W. Berger, 86 Cooper Ave., Camden, N. J.
Associate, Philadelphia Branch

Thomas J. Grindler, Jr., % H. S. Getty & Co., 1015 Thayer St., Philadelphia, Pa. Active, Philadelphia Branch

Ellis H. Thompson, 7233 Ogontz Ave., Philadelphia, Pa.
Associate, Philadelphia Branch

Robert A. Graham, 710 Stone Rd., Rochester, N. Y.
Associate, Rochester Branch

CONTROL YOUR PLATING SOLUTIONS
KOCOUR TEST SETS
KOCOUR CO. • 4725 S. CHRISTIANA AVE. • CHICAGO

Membership Campaign

BRANCH	May 1, 1940	Change in Membership	Percent Change
Lancaster	25	+16	+64
Montreal	23	+6	+26.1
Springfield	51	+12½	+24.5
Boston	79	+18	+22.8
Dayton	62	+11	+17.7
Grand Rapids	52	+9	+17.3
Waterbury	66	+8½	+12.9
Cincinnati	36	+4½	+12.5
Anderson	38	+4	+10.5
Rochester	62	+6½	+10.5
San Francisco	20	+2	+10
Prov.-Attleboro	38	+3	+7.9
Cleveland	70	+5½	+7.9
Pittsburgh	34	+1½	+4.4
New York	102	+4	+3.9
Toledo	40	+1½	+3.8
Milwaukee	84	+3	+3.6
Newark	125	+2½	+2
Philadelphia	133	+1½	+1.1
Los Angeles	59	0	0
Bing.-Syracuse	22	0	0
New Haven	115	—½	—0.4
Chicago	225	—2½	—1.1
St. Louis	77	—1	—1.3
Detroit	250	—5	—2
Toronto	67	—1½	—2.2
Bridgeport	71	—2	—2.8
Hartford	45	—2	—4.4
Baltimore-Wash.	49	—4	—8.2
Buffalo	57	—13	—22.8

NOTE: Honorary members are included with each Branch.

J. F. Bubela, 1879 South 14th St., St. Louis, Mo. St. Louis Branch
Richard E. Waite, 614 Broadway, Rochester, N. Y.
Associate, Rochester Branch
Ralph Dettman, 105 Forgham Rd., Rochester, N. Y.
Associate, Rochester Branch
Ernest Hinterleitner, 829 North Ave., West, Westfield, N. J.
Associate, Newark Branch
Bernard R. Weber, 1912 S. 82nd St., Milwaukee, Wis.
Associate, Milwaukee Branch
Edward Ladimer Cableck, 2636 Taylor Road, Cleveland Heights, Ohio
Active, Cleveland Branch
L. E. Hummel, 17317 Franklin Blvd., Lakewood, Ohio
Active, Cleveland Branch
Joseph P. Mickiewicz, 358 21st Ave., Paterson, N. J. Active, Newark Branch
Carl D. Chambers, 447 West End Ave., Elizabeth, N. J.
Active, Newark Branch
James J. Monagle, 152 Main Street, Matawan, N. J.
Associate, Newark Branch
John C. Bradley, c/o The American Brass Co., Waterbury, Conn.
Active, Waterbury Branch
W. H. Safranek, Jr., 68 South Central Ave., Chicago, Ill.
Associate, Chicago Branch
Clifford Ryan, 32 S. Kilmer St., Dayton, Ohio Associate, Dayton Branch
James E. Weaver, Box 440 R.R.1, Dayton, Ohio Associate, Dayton Branch
Herman E. Austen, 137 Ashley St., Dayton, Ohio Associate, Dayton Branch

APPLICATIONS

August S. Schwering, 3930 Decoursey Ave., Rosedale, Cov., Ky.
Active, Cincinnati Branch
R. C. Wiese, 235 Triangle Ave., Dayton, Ohio Associate, Cincinnati Branch
Edwin C. Woistmann, 2331 Victor St., Cincinnati, Ohio
Associate, Cincinnati Branch
Herbert M. Brown, 16 Edgar Ave., Dayton, Ohio
Associate, Dayton Branch
F. H. Thompson, 32 Watervliet Ave., Dayton, Ohio
Associate, Dayton Branch
Walter E. Weise, 2234 North 61 St., Wauwatosa, Wis.
Associate, Milwaukee Branch
Joseph Citron, 2043 Holland Ave., Bronx, N. Y. Active, New York Branch
Herman Wilk, 80 Monroe St., Brooklyn, N. Y. Active, New York Branch
William M. Vella, Egyptian Lacquer Co., Rockefeller Center, New York, N. Y.
Associate, New York Branch